

April 2024 Office of Chemical Safety and Pollution Prevention

# Draft Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation Including Legacy Uses and Associated Disposals of Asbestos

## **Systematic Review Supplemental File:**

Data Quality Evaluation and Data Extraction Information for Physical and Chemical Properties

CASRN: 1332-21-4

April 2024

This supplemental file contains information regarding the data extraction and evaluation results for data sources that were considered for the Supplement to the *Draft Risk Evaluation for Asbestos Part 2: Supplemental Evaluation Including Legacy Uses and Associated Disposals of Asbestos* that underwent systematic review. EPA used the TSCA systematic review process described in the *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances* (also referred to as the '2021 Draft Systematic Review Protocol'). The systematic review steps are further described in the *Draft Risk Evaluation for Asbestos Part 2: Supplemental Evaluation for Asbestos Part 2: Supplemental Evaluation Including Legacy Uses and Associated Disposals of Asbestos – Systematic Review Protocol.* EPA conducted data extractions and data quality evaluations based on author-reported descriptions and results; additional analyses (*e.g.*, statistical analyses) potentially conducted by EPA are not contained in this supplemental file. Additionally, the overall quality determination (OQD) for each reference represents the data as a whole for each study, and not for individual metric domains within a study.

# Table of Contents

HERO ID	Reference	Page
Physical Form or State		
3647242	Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.	11
786664	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).	23
733675	Bignon, J. (1989). Mineral fibres in the non-occupational environment. IARC Scientific Publication no. 90 :3-29.	28
3981007	Cameo Chemicals, (2016). Chemical datasheet: asbestos.	31
3981008	Cameo Chemicals, (2016). Chemical datasheet: asbestos (blue).	32
3646977	Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30.	33
7607106	Haz-Map, (2021). Haz-Map: Asbestos.	37
7607107	Haz-Map, (2021). Haz-Map: Anthophyllite.	39
3970851	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite).	41
3084215	Le Bouffant, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33.	53
3860485	(2017). PubChem: Chrysotile.	54
3860486	(2017). PubChem: Crocidolite.	59
3860489	(2016). Agent name: Anthophyllite.	61
3982328	NIH, (2016). Report on carcinogens: Asbestos.	62
192177	NIOSH, (2007). NIOSH pocket guide to chemical hazards.	68
3974865	NIOSH, (2016). NIOSH pocket guide to chemical hazards: Asbestos.	69
3978149	NIOSH, (2014). International chemical safety cards (ICDC): Chrysotile.	70
3978150	NIOSH, (2014). International chemical safety cards (ICDC): Crocidolite.	71
9109830	NIOSH, (2019). NIOSH pocket guide to chemical hazards: Asbestos.	72
3827272	U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System (IRIS).	73
3975020	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.	79
3859385	Virta, R. L. (2004). Asbestos. 3:288-319.	83
6860096	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated Ferroelectrics 188(1):136-147.	87
7924810	Elsevier, (2021). Reaxys: physical-chemical property data for Chrysotile.	88
7924812	Elsevier, (2021). Reaxys: physical-chemical property data for Anthophyllite.	90

Table of Contents

7924814	Elsevier, (2021). Reaxys: physical-chemical property data for Tremolite.	92
7924815	Elsevier, (2021). Reaxys: physical-chemical property data for Actinolite.	94
7924733	NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.	95
3827307	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151- 160.	97
7924810	Elsevier, (2021). Reaxys: physical-chemical property data for Chrysotile.	127
7924812	Elsevier, (2021). Reaxys: physical-chemical property data for Anthophyllite.	128
5333260	Larrañaga, M. D., Lewis, R. J., Lewis, R. A. (2016). Hawley's condensed chemical dictionary. :57, 58, 1232.	129
7924733	NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.	137
3581598	Sucik, G., Szaboova, A., Popovic, L., Hrsak, D. (2016). The relationship between thermal treatment of serpentine and its reactivity. Materiali in Tehnologije 50(1):55-58.	148
Melting Point		
786664	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).	149
5155632	California Office of Environmental Health Hazard Assessment (OEHHA) (2011). Appendix B: Chemical-specific summaries of the infor- mation used to derive unit risk and cancer potency values.	154
3981007	Cameo Chemicals, (2016). Chemical datasheet: asbestos.	155
3981008	Cameo Chemicals, (2016). Chemical datasheet: asbestos (blue).	156
3582618	Candela, P. A., Crummett, C. D., Earnest, D. J., Frank, M. R., Wylie, A. G. (2007). Low-pressure decomposition of chrysotile as a function of time and temperature. American Mineralogist 92(10):1704-1713.	157
3981018	EC, (2012). Practical guidelines for the information and training of workers involved with asbestos removal or maintenance work.	158
9109807	ECHA, (2021). ECHA scientific report for evaluation of limit values for asbestos at the workplace.	159
7924812	Elsevier, (2021). Reaxys: physical-chemical property data for Anthophyllite.	162
7924815	Elsevier, (2021). Reaxys: physical-chemical property data for Actinolite.	163
7924816	Elsevier, (2021). Reaxys: physical-chemical property data for Richterite.	164
3581958	Fujishige, M., Sato, R., Kuribara, A., Karasawa, I., Kojima, A. (2006). CaCl2 addition effect and melt formation in low-temperature decomposition of chrysotile with CaCO3. Ceramic Society of Japan. Journal 114(1334):844-848.	165
7473172	Goncharov, Y. I., Kholodova, N. A., Sergeev, N. E. (1991). Amphibole-based thermal-insulating ceramics. 47(7-8):267-270.	166
3970851	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite).	167
3581993	Jenkins, D. M., Holland, T. J. B., Clare, A. K. (1991). EXPERIMENTAL-DETERMINATION OF THE PRESSURE-TEMPERATURE STABILITY FIELD AND THERMOCHEMICAL PROPERTIES OF SYNTHETIC TREMOLITE. American Mineralogist 76(3-4):458- 469.	171
6879492	Kusiorowski, R., Zaremba, T., Gerle, A., Piotrowski, J., Simka, W., Adamek, J. (2015). Study on the thermal decomposition of crocidolite asbestos. Journal of Thermal Analysis and Calorimetry :1585-1595.	172
3860485	(2017). PubChem: Chrysotile.	173
3860486	(2017). PubChem: Crocidolite.	175
	Page <b>4</b> of <b>522</b>	

## Table of Contents

192177	NIOSH, (2007). NIOSH pocket guide to chemical hazards.	176
3974865	NIOSH, (2016). NIOSH pocket guide to chemical hazards: Asbestos.	177
3978149	NIOSH, (2014). International chemical safety cards (ICDC): Chrysotile.	178
3978150	NIOSH, (2014). International chemical safety cards (ICDC): Crocidolite.	179
9109830	NIOSH, (2019). NIOSH pocket guide to chemical hazards: Asbestos.	180
7924733	NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.	181
7607109	OSHA, (2019). Asbestos, all forms.	182
6878583	Poniatowska, A., Andrzejewska-Gorecka, D., Macherzynski, B., Kisiel, M. (2019). Thermal Decomposition of Asbestos Fiber from Asbestos Cement Wastes. Rocznik Ochrona Srodowiska 21(2):855-867.	183
3975020	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.	184
3827175	Virta, R. L. (2011). Asbestos. :1-40.	189
3859385	Virta, R. L. (2004). Asbestos. 3:288-319.	193
3531606	Yoshikawa, N., Kashimura, K., Hashiguchi, M., Sato, M., Horikoshi, S., Mitani, T., Shinohara, N. (2015). Detoxification mechanism of asbestos materials by microwave treatment. Journal of Hazardous Materials 284(Elsevier):201-206.	197
<b>Boiling Point</b>		
3860485	(2017). PubChem: Chrysotile.	198
3974865	NIOSH, (2016). NIOSH pocket guide to chemical hazards: Asbestos.	199
Density		
786664	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).	200
3646977	Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30.	205
3982121	Larranaga, M. D., Lewis, R. J., Lewis, R. A. (2016). Ascorbic acid. :117.	208
3860485	(2017). PubChem: Chrysotile.	209
3860486	(2017). PubChem: Crocidolite.	211
3978149	NIOSH, (2014). International chemical safety cards (ICDC): Chrysotile.	212
3978150	NIOSH, (2014). International chemical safety cards (ICDC): Crocidolite.	213
3975020	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.	214
3859385	Virta, R. L. (2004). Asbestos. 3:288-319.	218
7924810	Elsevier, (2021). Reaxys: physical-chemical property data for Chrysotile.	222
7924812	Elsevier, (2021). Reaxys: physical-chemical property data for Anthophyllite.	223
7924815	Elsevier, (2021). Reaxys: physical-chemical property data for Actinolite.	224
5333260	Larrañaga, M. D., Lewis, R. J., Lewis, R. A. (2016). Hawley's condensed chemical dictionary. :57, 58, 1232.	225
7924733	NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.	227

## Table of Contents

6880237	Zhong, Q., Liao, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Black Nephrite Jade from Guangxi, Southern China. Gems & Gemology 55(2):198-	229
Particle Size	215.	
3647242	Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.	231
785518	Bailey, K. F., Kelse, J., Wylie, A. G., Lee, R. J. (2006). The asbestiform and prismatic mineral growth habit and their relationship to cancer studies: A pictorial presentation.	238
55	Burdett, G. J., Rood, A. P. (1983). Membrane-filter, direct-transfer technique for the analysis of asbestos fibers or other inorganic particles by transmission electron microscopy. Environmental Science and Technology 17(11):643-648.	241
3582618	Candela, P. A., Crummett, C. D., Earnest, D. J., Frank, M. R., Wylie, A. G. (2007). Low-pressure decomposition of chrysotile as a function of time and temperature. American Mineralogist 92(10):1704-1713.	244
6892000	Chatfield, E. J. (1999). Correlated measurements of airborne asbestos-containing particles and surface dust. American society for testing and materials special technical publication 1342:378-402.	248
3096394	Cluff, D. L., Patitsas, A. J. (1992). Size Characterization of Asbestos Fibers by Means of Electrostatic Alignment and Light-Scattering Techniques. Aerosol Science and Technology 17(3):186-198.	250
2342642	Duncan, K. E., Cook, P. M., Gavett, S. H., Dailey, L. A., Mahoney, R. K., Ghio, A. J., Roggli, V. L., Devlin, R. B. (2014). In vitro determinants of asbestos fiber toxicity: effect on the relative toxicity of Libby amphibole in primary human airway epithelial cells. Particle and Fibre Toxicology 11(2):2.	252
3646977	Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30.	255
3580641	Gentry, J. W. (1987). SURVEY OF RECENT MEASUREMENTS WITH ASBESTOS FIBERS. Journal of Aerosol Science 18(5):47-486.	258
3583340	Huntington, J. C., Ptasienski, J. J., Bunker, K. L., Strohmeier, B. R., Van Orden, D. R., Lee, R. J. (2008). A new method for fracturing mineral particles for cross-sectional FESEM analysis. Periodico di Mineralogia 77(2):43-50.	261
3080916	Keane, M. J., Stephens, J. W., Zhong, B. Z., Miller, W. E., Ong, T. M., Wallace, W. E. (1999). A study of the effect of chrysotile fiber surface composition on genotoxicity in vitro. Journal of Toxicology and Environmental Health, Part A: Current Issues 57(8):529-541.	265
3084215	Le Bouffant, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33.	267
3615886	Lebaron, E. I., Boettner, E. A. (1980). Fiber motion analysis by two-pulse holography. Applied Optics 19(6):891-894.	272
759182	Lowers, H. A., Bern, A. M. (2009). Particle size characterization of water-elutriated Libby amphibole 2000 and RTI international amosite. :3.	273
6876819	Myasoedov, A. V., Kalmykov, A. E., Kirilenko, D. A., Sorokin, L. M. (2017). TEM Investigation of Nanostructures with a High Aspect Ratio. :143-148.	276
3982328	NIH, (2016). Report on carcinogens: Asbestos.	278
3083397	Parsons, R. C., Bryant, D. G., Edstrom, H. W. (1986). Variation in fibre and dust counts in an asbestos mine and mill. Annals of Occupational Hygiene 30(1):63-75.	280
6872531	Patitsas, A. J. (1988). SIZE CHARACTERIZATION OF ASBESTOS FIBERS USING THE RAYLEIGH-DEBYE-GANS THEORY. Journal of Colloid and Interface Science :15-23.	282
380	Spurny, K. R. (1989). On the release of asbestos fibers from weathered and corroded asbestos cement products. Environmental Research 48(1):100-116.	284
2073705	Spurny, K. R., Stöber, W., Opiela, H., Weiss, G. (1979). On the evaluation of fibrous particles in remote ambient air. Science of the Total Environment 11(1):1-40.	286
6867217	Spurny, K. R., Stöber, W., Opiela, H., Weiss, G. (1979). Size-selective preparation of inorganic fibers for biological experiments. American Industrial Hygiene Association Journal 40(1):20-38.	287

Asbestos	Table of Contents			
29927	Timbrell, V. (1982). Deposition and retention of fibres in the human lung. Annals of Occupational Hygiene 26(1-4):347-369.	291		
3097547	Timbrell, V., Grittiths, D. M., Pooley, F. D. (1971). Possible Biological Importance of Fibre Diameters of South African Amphiboles. Nature 232(5305):55-56.	292		
3827272	U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System (IRIS).	295		
3975014	USGS, (2009). Particle size characterization of water-elutriated libby amphibole 2000 and RTI international amosite.	297		
3975020	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.	300		
3584949	Van Orden, D. R., Lee, R. J., Badger, S. (2006). Characterizing asbestos fiber comminution resulting from preparation of environmental samples. Powder Technology 162(3):183-189.	305		
3584086	Virta, R. L., Segreti, J. M. (1987). A MODEL FOR PREDICTING CROCIDOLITE FIBER SIZE DISTRIBUTIONS. Environmental Research 44(1):148-160.	307		
3101498	Virta, R. L., Shedd, K. B., Wylie, A. G., Snyder, J. G. (1983). Chapter 47. Size and shape characteristics of amphibole asbestos (amosite) and amphibole cleavage fragments (actinolite, cummingtonite) collected on occupational air monitoring filters. :633-643.	309		
3531545	Wagner, J. (2015). Analysis of serpentine polymorphs in investigations of natural occurrences of asbestos. Environmental Science: Processes & Impacts 17(5):985-996.	313		
711568	Webber, J. S., Blake, D. J., Ward, T. J., Pfau, J. C. (2008). Separation and characterization of respirable amphibole fibers from Libby, Montana. Inhalation Toxicology 20(8):733-740.			
3531568	Wu, L., Ortiz, C. P., Jerolmack, D. J. (2017). Aggregation of Elongated Colloids in Water. Langmuir 33(2):622-629.	317		
Vapor Pressure				
7607028	ACTOR, (2021). ACTOR: Asbestos.	319		
3981007	Cameo Chemicals, (2016). Chemical datasheet: asbestos.	320		
3981008	Cameo Chemicals, (2016). Chemical datasheet: asbestos (blue).	321		
3860486	(2017). PubChem: Crocidolite.	322		
192177	NIOSH, (2007). NIOSH pocket guide to chemical hazards.	323		
3974865	NIOSH, (2016). NIOSH pocket guide to chemical hazards: Asbestos.	324		
9109830	NIOSH, (2019). NIOSH pocket guide to chemical hazards: Asbestos.	325		
logKow				
Water Solubility				
786664	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).	326		
3860485	(2017). PubChem: Chrysotile.	331		
3860486	(2017). PubChem: Crocidolite.	332		

#### PUBLIC RELEASE DRAFT - DO NOT CITE OR QUOTE April 2024 Table of Contents

Asbestos 3975020 USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses. 333 Flash Point Autoflammability рКа Viscosity **Refractive Index** 3647242 334 Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127. 3827307 Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-340 160. 785518 Bailey, K. F., Kelse, J., Wylie, A. G., Lee, R. J. (2006). The asbestiform and prismatic mineral growth habit and their relationship to cancer 346 studies: A pictorial presentation. 7924810 351 Elsevier, (2021). Reaxys: physical-chemical property data for Chrysotile. 7924816 355 Elsevier, (2021). Reaxys: physical-chemical property data for Richterite. 6874055 Lott, P. E. (2002). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers - an update. 357 Microchemical Journal 72(3):251-254. 6866754 363 Lott, P. F. (1989). Correlating dispersion staining colors to the numerical value of the refractive-index for asbestos fibers. Microchemical Journal 39(2):145-148. 369 3860485 (2017). PubChem: Chrysotile. 7924733 NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5. 370 3582855 Seshan, K. (1983). How are the physical and chemical properties of chrysotile asbestos altered by a 10-year residence in water and up to 5 371 days in simulated stomach acid?. Environmental Health Perspectives 53(NOV):143-148. 3827272 U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information 373 System (IRIS). 6887461 Verkouteren, J. R., Wylie, A. G., Steel, E. B., Lim, M. S. (1995). Analysis of the tremolite/actinolite series using high precision refractive 377 index measurements. Microbeam Analysis :27-28. 3859385 Virta, R. L. (2004). Asbestos. 3:288-319. 378 6860096 Xu, X. M., Li, Y. O., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of 382 textile. Integrated Ferroelectrics 188(1):136-147. 6880237 393 Zhong, Q., Liao, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Black Nephrite Jade from Guangxi, Southern China. Gems & Gemology 55(2):198-215. Henry's Law Nanomaterial Zeta 3080916 Keane, M. J., Stephens, J. W., Zhong, B. Z., Miller, W. E., Ong, T. M., Wallace, W. E. (1999). A study of the effect of chrysotile fiber 395 surface composition on genotoxicity in vitro. Journal of Toxicology and Environmental Health, Part A: Current Issues 57(8):529-541. 3078027 Lavkulich, L. M., Schreier, H. E., Wilson, J. E. (2014). Effects of natural acids on surface properties of asbestos minerals and kaolinite. 396 Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering 49(6):617-624.

## Table of Contents

3084540	Light, W. G., Wei, E. T. (1977). Surface charge and hemolytic activity of asbestos. Environmental Research 13(1):135-145.	397
3616568	Light, W. G., Wei, E. T. (1977). Surface charge and asbestos toxicity. Nature 265(5594):537-539.	401
3982328	NIH, (2016). Report on carcinogens: Asbestos.	403
3086336	Pollastri, S., Gualtieri, A. F., Gualtieri, M. L., Hanuskova, M., Cavallo, A., Gaudino, G. (2014). The zeta potential of mineral fibres. Journal of Hazardous Materials 276:469-479.	404
7475373	Schiller, J. E., Payne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibres.	413
3975020	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.	417
3584063	Vidovic, K., Lovrecek, B., Hraste, M. (1996). Influence of surface charge on sedimentation and filtration behaviour of fibrous material. Chemical and Biochemical Engineering Quarterly 10(1):33-38.	420
3531568	Wu, L., Ortiz, C. P., Jerolmack, D. J. (2017). Aggregation of Elongated Colloids in Water. Langmuir 33(2):622-629.	421
Dielectric Constant		
7924810	Elsevier, (2021). Reaxys: physical-chemical property data for Chrysotile.	422
7924814	Elsevier, (2021). Reaxys: physical-chemical property data for Tremolite.	423
UV and Visible Absorption		
Other Properties		
3827309	Addison, W. E., Neal, G. H., Sharp, J. H., White, A. D. (1966). Amphiboles. Part IV. Surface properties of amosite and crocidolite. Journal of the Chemical Society. Section A: Inorganic, Physical, and Theoretical Chemistry 1966:79-81.	424
3827307	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.	427
3099513	Bartosiewicz, L. (1973). Improved Techniques of Identification and Determination of Airborne Asbestos. American Industrial Hygiene Association Journal 34(6):252-259.	463
3083760	Hwang, C. Y. (1983). Size and shape of airborne asbestos fibres in mines and mills. British Journal of Industrial Medicine 40(3):273-279.	464
3970851	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite).	470
6865913	Lahondère, D., Cagnard, F., Wille, G., Duron, J., Misseri, M. (2018). TEM and FESEM characterization of asbestiform and non-asbestiform actinolite fibers in hydrothermally altered dolerites (France). Environmental Earth Sciences 77(10):385.	476
3860485	(2017). PubChem: Chrysotile.	477
3582855	Seshan, K. (1983). How are the physical and chemical properties of chrysotile asbestos altered by a 10-year residence in water and up to 5 days in simulated stomach acid?. Environmental Health Perspectives 53(NOV):143-148.	480
3581901	Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research 23(2):348-361.	481
3615922	Snyder, J. G., Virta, R. L., Segreti, J. M. (1987). Evaluation of the phase contrast microscopy method for the detection of fibrous and other elongated mineral particulates by comparison with a STEM technique. American Industrial Hygiene Association Journal 48(5):471-477.	486
3615789	Thorne, P. S., Lightfoot, E. N., Albrecht, R. M. (1985). Physicochemical characterization of cryogenically ground, size separated, fibro- genic particles. Environmental Research 36(1):89-110.	492
3827272	U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System (IRIS).	493

Asbestos	Table of Contents			
6873950	Vaillancourt, A., Denes, G., Le Van Mao, R. (1997). Reactivity of chrysotile asbestos in acids: Mechanism of transformation to silicon dioxide hemihydrate upon leaching of magnesium. Materials Research Society Symposium Proceedings, vol. 453 :71-76.	495		
3827175	Virta, R. L. (2011). Asbestos. :1-40.	497		
3859385	Virta, R. L. (2004). Asbestos. 3:288-319.	500		
6880237	Zhong, Q., Liao, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Black Nephrite Jade from Guangxi, Southern China. Gems & Gemology 55(2):198-215.			
Miscellaneous				
3646977	Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30.	518		
List of Abbreviations and Ac	cronyms for Data Quality Evaluation and Extraction Tables	521		

Page 10 of 522

Study Citation: OECD Harmonized	Anonymous (19 Physical Form of	989). NIOSH Manual of Analytical Met or State	hods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.
Template:	5			
HERO ID:	3647242			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5: chrysotile		
Confidentiality. Type, and (	Guideline	None: experimental: not reported		
Solvent, Reactivity, Storage	e. and Stability	NR: NR: NR		
Radiolabel, Source, State, a	and Purity	None; NR; fibers; NR		
Results Value	•	colorless to light brown upon being hea	ated; nonpleochroic	
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	itv			
Bollan 2. Test Renabl	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	Overall Quality Determination High			

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 2 of 12

Study Citation: OECD Harmonized	Anonymous (19 Physical Form o	89). NIOSH Manual of Analytical Me r State	thods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.
HERO ID:	3647242			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability nd Purity	12001-29-5; chrysotile None; experimental; not reported NR; NR; NR; NR None; NR; fibers; NR wavy fibers with kinks; splayed ends o Not Reported	n larger bundles	
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 3 of 12

Study Citation: OECD Harmonized Template:	Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127. Physical Form or State			
HERO ID:	3647242			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-28-4; crocidolite		
Confidentiality, Type, and C	Guideline	None; experimental; not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	None; NR; fibers; NR Notes: riebeckite		
Results Value		characteristic blue color; pleochroic		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ts.			
Domain 2. Test Kellauli	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Methe 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
		· ·		
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination High				

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 4 of 12

Study Citation: OECD Harmonized	Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127. Physical Form or State			
HERO ID:	3647242			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity Results Value		12001-28-4; crocidolite None; experimental; not reported NR; NR; NR; NR None; NR; fibers; NR Notes: Reported straight fibers and fiber bundles; longer Not Reported	as: Crocidolite (Rie	beckite) re; splayed ends on bundles
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	Matria 5.	Databasas	High	
	wietric 5:	Databases	High	peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	Overall Quality Determination High			

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 5 of 12

Study Citation: OECD Harmonized	Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127. Physical Form or State			
HERO ID:	3647242			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		17068-78-9; anthophyllite		
Confidentiality, Type, and C		None; experimental; not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	na Purity	None; NR; IIDER; NR	a fragmanta may be	a magant
Results Details		Not Reported	ige magnitudes may be	s present.
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
2 0	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination High				

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 6 of 12

Study Citation: OECD Harmonized	Anonymous (19 Physical Form o	89). NIOSH Manual of Analytical Me r State	thods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.		
HERO ID:	3647242					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		17068-78-9; anthophyllite				
Confidentiality, Type, and C	Guideline	None; experimental; not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	None; NR; fibers; NR				
Results Value		colorless to light brown; non-pleochro	ic to weakly pleochro	nic		
Results Details		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ts.					
Domain 2. Test Kendom	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	mouro 5.	(Method Objectivity)	mourum	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 5: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	y Determi	nation	High			

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 7 of 12

Study Citation:	Anonymous (19 Physical Form (	989). NIOSH Manual of Analytical Met	hods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.		
Template	i nysicai i onn o	J. State				
HERO ID:	3647242					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		14567-73-8; tremolite				
Confidentiality, Type, and C	Guideline	None; experimental; not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	None; NR; fibers; NR				
Results Value		straight and curved fibers; cleavage frag	gment common; larg	e fiber bundles show splayed ends		
Results Details		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
Domain 2. Test Kelldoll	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	metric 5.	(Method Objectivity)	Wiedrum	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Other						
Domain 5: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Quality Determination H						

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 8 of 12

Study Citation: OECD Harmonized	Anonymous (19 Physical Form o	89). NIOSH Manual of Analytical Me or State	thods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.
HERO ID:	3647242			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality. Type, and C	Guideline	14567-73-8; tremolite None: experimental: not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	None; NR; fibers; NR		
Results Value		colorless		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance			6	
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>		High		

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 9 of 12

Study Citation: OECD Harmonized	Anonymous (19 Physical Form c	189). NIOSH Manual of Analytical Met	hods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.	
Template:	i nysiou i oim e	, State			
HERO ID:	3647242				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		13768-00-8; actinolite			
Confidentiality, Type, and C	Guideline	None; experimental; not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	None; NR; fibers; NR			
Results Value		straight and curved fibers; cleavage frag	gment common; larg	e fiber bundles show splayed ends	
Results Details		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
Domain 2. Test Kendon	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	metric 5.	(Method Objectivity)	meanum	towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	ty Determi	nation	High		

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 10 of 12

Study Citation: OECD Harmonized	Anonymous (19 Physical Form o	Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127. Physical Form or State				
HERO ID:	3647242					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability nd Purity	13768-00-8; actinolite None; experimental; not reported NR; NR; NR; NR None; NR; fibers; NR green; weakly to moderately pleochroic Not Reported				
			EVALUATIO	N		
Domain Domain 1: Substance		Metric	Rating	Comments		
Domain 1. Substance	Metric 1.	Representativeness	High	Data are measured or estimated for the subject chemical substance		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	itv					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	y Determi	nation	High			

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 11 of 12

Study Citation: OECD Harmonized Template:	Anonymous (19 Physical Form o	Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127. Physical Form or State			
HERO ID:	3647242				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability nd Purity	12172-73-5; cummingtonite-grunerite ( None; experimental; not reported NR; NR; NR; NR None; NR; fibers; NR Notes: amosite straight fibers and fiber bundles; bundle Not Reported	(amosite) e ends appear broom-	-like or splayed	
Domain		Metric	EVALUATIO Rating	N Comments	
Domain 1: Substance			6		
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	ity				
2 0	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Quality Determination High					

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3647242 Table: 12 of 12

Study Citation: OECD Harmonized Template:	Anonymous (19 Physical Form o	nonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127. hysical Form or State				
HERO ID:	3647242					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material		12172-73-5; cummingtonite-grunerite (	amosite)			
Confidentiality, Type, and C	Buideline	None; experimental; not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	None; NR; fibers; NR Notes: amosite				
Results Value		colorless to brown upon heating; may b	e weakly pleochroic			
Results Details		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	tv					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

Study Citation: OECD Harmonized	ATSDR, (2001) Physical Form of	. Toxicological profile for asbestos (Up or State	pdate, September 2	001).	
Template:					
HERO ID:	786664				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		17068-78-9; anthophyllite			
Confidentiality, Type, and C	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; solid; NR Notes: NR			
Results Value		solid			
Results Details		gray, white, brown-gray, green			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance			U		
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2. Test Reliabil	itv				
Domain 2. Test Renabil	Metric 3:	Reliability/Unbiased	N/A	Rating of this factor is not applicable to this kind of information.	
		(Method Objectivity)			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Demain 2. Other					
Domain 5: Other	Matric 5:	Databases	Uich	The information or date is from a recognized date collection/repository where date are	
	Metric 5.	Databases	rigi	peer-reviewed by experts in the field, are broadly available to the public for review and use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Quality Determination High				

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

Study Citation: OECD Harmonized	ATSDR, (2001). Physical Form of	. Toxicological profile for asbestos (Uj or State	odate, September 2	001).
Template:	i nysicar i orm o	i State		
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-28-4; crocidolite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; solid; NR Notes: NR		
Results Value		solid		
Results Details		lavender, blue, green		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
Domain 2. Test Kendoli	Metric 3	Reliability/Unbiased	N/A	Rating of this factor is not applicable to this kind of information
	metric 5.	(Method Objectivity)	1.071	Rung of this factor is not approache to this kind of mornation.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Other				
Domain 5: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
	Metric 5.	Databases	Ingi	peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 786664 Table: 3 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Physical Form of	Toxicological profile for asbestos (Up r State	odate, September 2	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value	Guideline e, and Stability ınd Purity	12172-73-5; amosite none; not specified; not specified NR; NR; NR; NR NR; NR; solid; NR Notes: NR solid		
Results Details		brown, gray, greenish		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	Metric 1	Representativeness	High	Data are measured or estimated for the subject chemical substance
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain D. Oulor	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination H				

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 786664 Table: 4 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Physical Form o	Toxicological profile for asbestos (Up r State	odate, September 20	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability and Purity	12001-29-5; chrysotile none; not specified; not specified NR; NR; NR; NR NR; NR; solid; NR Notes: NR solid white, gray, green, yellowish		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	Matria 1.	Demacentativeness	Hich	Determined an estimate of free the subject the mined whether
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity		C	
	Metric 3:	Reliability/Unbiased	Medium	Rating of this factor is not applicable to this kind of information.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	nation	High	

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 786664 Table: 5 of 5

Study Citation: OECD Harmonized Template:	ATSDR, (2001). Physical Form o	Toxicological profile for asbestos (Up r State	odate, September 2	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability and Purity	14567-73-8; tremolite none; not specified; not specified NR; NR; NR; NR NR; NR; solid; NR Notes: NR solid white to pale green		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determin	nation	High	

Study Citation: OECD Harmonized	Bignon, J. (1989). Mineral fibres in the non-occupational environment. IARC Scientific Publication no. 90 :3-29. Physical Form or State				
HERO ID:	733675				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12172-73-5; Amosite			
Confidentiality, Type, and C	Guideline	None; Experimental; None			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: cummingtoni	te-grunerite		
Results Value		Brown asbestos			
Results Details		Amphibole mineral group, Mg7(OH)2S	Si8O22 Fe7(OH)2Si	8022	
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	N/A	Rating of this factor is not applicable to this kind of information.	
		(Method Objectivity)			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other	36.55		TT: 1		
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Quality Determination High					

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 733675 Table: 2 of 3

Study Citation: OECD Harmonized	Bignon, J. (1989 Physical Form o	)). Mineral fibres in the non-occupation r State	nal environment. L	ARC Scientific Publication no. 90 :3-29.	
Template: HERO ID:	733675				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12001-28-4; Crocidolite			
Confidentiality, Type, and C	Guideline	None; Experimental; None			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: riebeckite			
Results Value		Blue asbestos			
Results Details		Amphibole mineral group, Na2Fe2 3+	Fe2+(OH)2Si8O22		
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance	M 1		TT: 1		
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	N/A	Rating of this factor is not applicable to this kind of information.	
	Matria 4.	(Method Objectivity)	NI/A	Define of this forten is not conficult, to this line of information	
	Metric 4:	Renability/Analytical Method	IN/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Quality Determination High					

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 733675 Table: 3 of 3

Study Citation:	Bignon I (1989	) Mineral fibres in the non-occupation	nal environment L	ARC Scientific Publication no. 90:3-29		
OECD Harmonized	Physical Form c	or State				
Template:	2					
HERO ID:	733675					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; None				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR				
Results Value		White asbestos				
Results Details		Serpentine mineral group, (MgFe)6(O	H)8Si4O10			
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Damain 2. Trat Daliahil	: <b>.</b> .					
Domain 2: Test Renabili	Ily Matria 2.	Daliability/Unbiased	NI/A	Define of this for the size of a wall what he this himd of information		
	Metric 5.	(Mathad Objectivity)	IN/A	Rating of this factor is not applicable to this kind of information.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	Hıgh	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	Overall Quality Determination High					

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3981007 Table: 1 of 1

Stada Citation	Carrie Charrie		_		
Study Citation: OFCD Harmonized	Physical Form	als, (2016). Chemical datasheet: asbesto	<b>DS</b> .		
Template:	T flystear T offin v	51 State			
HERO ID:	3981007				
			EXTRACTIO	N	
Parameter		Data		-	
CASRN and Test Material		1332-21-4; Asbestos			
Confidentiality, Type, and	Guideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR			
Results Value		Slender, strong, flexible fibers; white, g	ray, green, or brown		
Results Details		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2. Test Reliabil	ity				
Domain 2. Test Remain	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other	M ( 1 5		TT' 1		
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Auglity Determination High				
	y Determin		111511		

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3981008 Table: 1 of 1

Study Citation: OECD Harmonized	Cameo Chemica Physical Form of	als, (2016). Chemical datasheet: asbestos or State	(blue).	
HERO ID:	3981008			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material	a	12001-28-4; Crocidolite		
Confidentiality, Type, and C		None; Experimental; Not applicable		
Padialabal Source State	e, and Stability	NR; NR; NR; NR NB: NB: Not Papartad: NB Notas: NB		
Results Value	and Furity	Slender fine flavy fiber blue		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Test Reliabil	itv			
Bollan 2. Test Renault	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	

Study Citation: OECD Harmonized	Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30. Physical Form or State				
Template:	1 11 9 51 6 11 1 6 11 1 6				
HERO ID:	3646977				
		EXTRACTION			
Parameter		Data			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and Guideline		None; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR			
Radiolabel, Source, State, and Purity		NR; NR; Solid; NR Notes: white asbestos; chemical formula 3MgO 2SiO2 2H2O			
Results Value		Typical chemical analysis of solid			
Results Details		40.3% Silica (SiO2), 0.7% Alumina (Al2O3), 1.0% Ferrous oxide (FeO), 1.5% Ferric oxide (Fe2O3), 0.2% Calcium oxide (CaO), 42.4% Magne- sium oxide (MgO), 0.2% Carbon dioxide (CO2), 13.7% water of crystallization			

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qual</b>	ity Determ	ination	Medium	

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3646977 Table: 2 of 4

Study Citation:Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30.OECD HarmonizedPhysical Form or State						
HERO ID:	3646977					
		EXTRACTION				
Parameter		Data				
CASRN and Test Material		12001-28-4; Crocidolite				
Confidentiality, Type, and	Guideline	None; not specified; not specified				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR Notes: blue asbestos; chemical formula Na2O 3FeO Fe2O3 8SiO2 H2O				
Results Value		Typical chemical analysis of solid				
Results Details		51.4% Silica (SiO2), 20.3% Ferrous oxide (FeO), 17.5% Ferric oxide (Fe2O3), 0.1% Manganous oxide (MnO), 0.8% Calcium oxide (CaO), 1.4% Magnesium oxide (MgO), 6.2% Sodium oxide (Na2O), 0.4% Carbon dioxide (CO2), 1.9% water of crystallization				
		EVALUATION				

			LIALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3646977 Table: 3 of 4

Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30. Physical Form or State				
3646977				
	EXTRACTION			
	Data			
	12172-73-5; Amosite			
uideline	None; not specified; not specified			
and Stability	NR; NR; NR			
nd Purity	NR; NR; Solid; NR Notes: chemical formula 1.5MgO 5.5FeO 8SiO2 H2O			
	Typical chemical analysis of solid			
	49.3% Silica (SiO2), 40.9% Ferrous oxide (FeO), 0.4% Ferric oxide (Fe2O3), 0.7% Manganous oxide (MnO), 0.4% Calcium oxide (CaO), 5.7%			
	Magnesium oxide (MgO), 0.2% Sodium oxide (Na2O), 0.3% Potassium oxide (K2O), 0.2% Carbon dioxide (CO2), 1.9% water of crystallization			
	Gaze, R. (1965). T Physical Form or S 3646977 uideline and Stability d Purity			

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			Medium	

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3646977 Table: 4 of 4

Study Citation: OECD Harmonized	Gaze, R. (1965). Physical Form of	Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30. Physical Form or State					
Template: HERO ID:	3646977						
			EXTRACTION				
Parameter		Data					
CASRN and Test Material		77536-67-5; Anthophyllite					
Confidentiality, Type, and C	Guideline	None; not specified; not specified					
Solvent, Reactivity, Storage, and Stability		NR; NR; NR; NR					
Radiolabel, Source, State, and Purity		NR; NR; Solid; NR Notes: chemical form	ula 7MgO 8SiO2 H2O	; CAS 17068-78-9			
Results Value		Typical chemical analysis of solid	Typical chemical analysis of solid				
Results Details		57.2% Silica (SiO2), 10.1% Ferrous oxide (FeO), 0.1% Ferric oxide (Fe2O3), 1.0% Calcium oxide (CaO), 29.2% Magnesium oxide (MgO), 0.1%					
		Sodium oxide (Na2O), 0.1% Potassium ox	tide (K2O), 2.2% wate	r of crystallization			
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance			0				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
2 chiun 2, outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			

Overall Ouality	Determination
	D $C$

Metric 6:

Models

Medium

N/A

Rating of this factor is not applicable to this kind of information.
HERO ID: 7607106 Table: 1 of 2

Study Citation:	Haz-Map, (2021)	). Haz-Map: Asbestos.					
Template:	T flystear Form of	State					
HERO ID:	7607106						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		1332-21-4; Asbestos					
Confidentiality, Type, and C	Guideline	none; not specified; not specified					
Solvent, Reactivity, Storage	e, and Stability	Not Reported; Not Reported; Not Report	ted; Not Reported				
Radiolabel, Source, State, a	nd Purity	Not Reported; Not Reported; Not Reported; Not Reported; Not Reported; 1332-21-4; 12001-28-4; 1217	orted; Not Reported 2-73-5; 77536-66-4	Notes: Chrysotile; Amosite; Crocidolite; Anthophylite; Tremolite; Actinolite; CAS			
Results Value		solid					
Results Details		Chrysotile is a curly fiber in intertwined	bundles; Amphibol	es are straight and needle-like in shape			
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	Medium	Data are reported for the subject chemical substance; however multiple CAS for various forms are reported.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2 <sup>.</sup> Test Reliabili	itv						
2 chian 2. Test Renabili	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	medie 5.	(Method Objectivity)	meanum	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other	16.1.5		TT: 1				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	y Determin	nation	High				

\* Related References: Cites: 'Sullivan p. 1215'

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

Study Citation: OECD Harmonized	Haz-Map, (2021). Haz-Map: Asbestos. Physical Form or State				
HERO ID:	7607106				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		1332-21-4; Asbestos			
Confidentiality, Type, and C	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	Not Reported; Not Reported; Not Repor	ted; Not Reported		
Radiolabel, Source, State, a	and Purity	Not Reported; Not Reported; Not Reported; Not Reported; 1232, 21, 4: 12001, 28, 4: 1217	orted; Not Reported	Notes: Chrysotile; Amosite; Crocidolite; Anthophylite; Tremolite; Actinolite; CAS	
Results Value		solid	2-75-5, 77550-00	r, <i>1155</i> 0-01-5, <i>1155</i> 0-00-0, 152201-52-0	
Results Details		White or greenish (chrysotile), blue (cro	cidolite), or gray-g	reen (amosite) fibrous, odorless solids	
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	Medium	Data are reported for the subject chemical substance; however multiple CAS for various forms are reported.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
	.,				
Domain 2: Test Reliabil	ILY Matria 2.	D -1:-1:1:4-/[]-1:	Mallin		
	Metric 3:	(Mathad Objectivity)	Medium	I here is no indication that the methodology for producing the information was biased	
	Metric 4.	(Method Objectivity) Reliability/Analytical Method	N/A	Bating of this factor is not applicable to this kind of information	
	Metric 4.	Renability// marytear wethod	1.171	Rating of this factor is not applicable to this kind of mornation.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Quality Determination High					

\* Related References: Cites: NIOSH

HERO ID: 7607107 Table: 1 of 2

Study Citation:	Haz-Map, (2021	). Haz-Map: Anthophyllite.				
<b>OECD</b> Harmonized	Physical Form of	r State				
Template:	•					
HERO ID:	7607107					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		17068-78-9: Anthonhyllite				
Confidentiality. Type, and C	Juideline	none: not specified: not specified				
Solvent, Reactivity, Storage	e. and Stability	NR: NR: NR: NR				
Radiolabel, Source, State, a	and Purity	NR: NR: solid: NR Notes: NR				
Results Value		solid				
Results Details		Gray, white, brown-gray, or green solid				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other	Domain 3: Other					
	Metric 5:	Databases	High	The information or data includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	y Determir	nation	High			

\* Related References: Value reported under HERO ID for Primary source: IARC 2012 HERO ID 3970851

Study Citation: OECD Harmonized Template:	Haz-Map, (2021) Physical Form of	). Haz-Map: Anthophyllite. r State		
HERO ID:	7607107			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a	Guideline e, and Stability nd Purity	17068-78-9; Anthophyllite none; not specified; not specified NR; NR; NR; NR NR; NR; solid; NR Notes: NR		
Results Value		solid White or gray fibrous solid		
Results Details		white of gray horous solid		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	Low	The data are from a primary source without expert peer-review or an unknown sec- ondary source without peer-review and references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determir	nation	Medium	

\* Related References: Cites: SPI MSDS

Study Citation:	IARC, (2012). A	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and					
<b>OECD Harmonized</b>	Physical Form of	Physical Form or State					
Template:	,						
HERO ID:	3970851						
			EXTRACTIO	N			
Parameter		Data					
CASRN and Test Material		12001-28-4; crocidolite					
Confidentiality, Type, and C	Guideline	none; not specified; none					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	None; NR; solid; NR					
Results Value		lavender, blue green					
Results Details		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	ty Determin	nation	High				

April 2024 HERO ID: 3970851 Table: 2 of 12 Physical Form or State Asbestos **Study Citation:** IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite). **OECD Harmonized** Physical Form or State **Template: HERO ID:** 3970851 EXTRACTION Parameter Data CASRN and Test Material 12001-29-5; chrysotile Confidentiality, Type, and Guideline none; not specified; None Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; solid; NR Results Value Curled sheet silicate, hollow central core **Results** Details Not Reported **EVALUATION** Domain Metric Rating Comments Domain 1: Substance Metric 1: Representativeness High Data are measured or estimated for the subject chemical substance. Metric 2: Appropriateness N/A Rating of this factor is not applicable to this kind of information. Domain 2: Test Reliability Metric 3: Reliability/Unbiased Medium There is no indication that the methodology for producing the information was biased (Method Objectivity) towards a particular product or outcome. Metric 4: Reliability/Analytical Method N/A Rating of this factor is not applicable to this kind of information. Domain 3: Other Metric 5: Databases High The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. **Overall Quality Determination** High

**PUBLIC RELEASE DRAFT - DO NOT CITE OR QUOTE** 

)S		Pł	April 2024 Ivsical Form or	State HERO ID: 3970851 Table: 3
Study Citation: OECD Harmonized	IARC, (2012). anthophyllite). Physical Form	ARC Monographs on the evaluation of c or State	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability and Purity	12001-29-5; chrysotile none; not specified; none NR; NR; NR; NR None; NR; solid; NR white, grey, green, yellowish Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	Metric 1: Metric 2:	Representativeness Appropriateness	High N/A	Data are measured or estimated for the subject chemical substance. Rating of this factor is not applicable to this kind of information.
Domain 2: Test Pelishi	ity			
Domain 2. Test Kellabili	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
_	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

S		Ph	nysical Form or	State HERO ID: 3970851 Table:
Study Citation: OECD Harmonized Template:	IARC, (2012). anthophyllite). Physical Form	ARC Monographs on the evaluation of c or State	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
HERO ID:	3970851			
Parameter		Data	EXTRACTIO	N
CASRN and Test Material Confidentiality, Type, and Solvent, Reactivity, Storag Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability and Purity	12172-73-5; amosite none; not specified; none NR; NR; NR; NR None; NR; solid; NR brown, grey, greenish Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	Metric 1: Metric 2:	Representativeness Appropriateness	High N/A	Data are measured or estimated for the subject chemical substance. Rating of this factor is not applicable to this kind of information.
Domain 2. Test Delishil	:+			
Domain 2. Test Kellauli	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quali	ty Determi	ination	High	Rating of this factor is not applicable to this kind of information.

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

			April 2024		
9S		Ph	sysical Form or	State HERO ID: 3970851 Table: 5	
Study Citation:	IARC, (2012).	ARC Monographs on the evaluation of ca	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and	
OECD Harmonized	Physical Form or State				
HERO ID:	3970851				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12172-73-5; amosite			
Confidentiality, Type, and	Guideline	none; not specified; none			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	None; NR; solid; NR			
Results Value		double chain silicate; long, straight, coar	se fibers		
Results Details		Not Reported			
			EVALUATIO	٧	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
		•	TT* 1		

April 2024 HERO ID: 3970851 Table: 6 of 12 Physical Form or State Asbestos **Study Citation:** IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite). **OECD Harmonized** Physical Form or State **Template: HERO ID:** 3970851 EXTRACTION Parameter Data CASRN and Test Material 77536-67-5; anthophyllite Confidentiality, Type, and Guideline none; not specified; none Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; solid; NR Results Value double chain silicate; short, very brittle fibers **Results** Details Not Reported **EVALUATION** Domain Metric Rating Comments Domain 1: Substance Metric 1: Representativeness High Data are measured or estimated for the subject chemical substance. Metric 2: Appropriateness N/A Rating of this factor is not applicable to this kind of information. Domain 2: Test Reliability Metric 3: Reliability/Unbiased Medium There is no indication that the methodology for producing the information was biased (Method Objectivity) towards a particular product or outcome. Metric 4: Reliability/Analytical Method N/A Rating of this factor is not applicable to this kind of information. Domain 3: Other Metric 5: Databases High The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. **Overall Quality Determination** High

**PUBLIC RELEASE DRAFT - DO NOT CITE OR QUOTE** 

April 2024 HERO ID: 3970851 Table: 7 of 12 Physical Form or State Asbestos **Study Citation:** IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite). **OECD Harmonized** Physical Form or State **Template: HERO ID:** 3970851 EXTRACTION Parameter Data CASRN and Test Material 77536-66-4; actinolite Confidentiality, Type, and Guideline none; not specified; none Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; solid; NR Results Value double chain silicate; brittle fibers **Results** Details Not Reported **EVALUATION** Domain Metric Rating Comments Domain 1: Substance Metric 1: Representativeness High Data are measured or estimated for the subject chemical substance. Metric 2: Appropriateness N/A Rating of this factor is not applicable to this kind of information. Domain 2: Test Reliability Metric 3: Reliability/Unbiased Medium There is no indication that the methodology for producing the information was biased (Method Objectivity) towards a particular product or outcome. Metric 4: Reliability/Analytical Method N/A Rating of this factor is not applicable to this kind of information. Domain 3: Other Metric 5: Databases High The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. **Overall Quality Determination** High

**PUBLIC RELEASE DRAFT - DO NOT CITE OR QUOTE** 

April 2024 HERO ID: 3970851 Table: 8 of 12 Physical Form or State Asbestos **Study Citation:** IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite). **OECD Harmonized** Physical Form or State **Template: HERO ID:** 3970851 EXTRACTION Parameter Data CASRN and Test Material 77536-67-5; anthophyllite Confidentiality, Type, and Guideline none; not specified; none Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; solid; NR Results Value grey, white, brown-grey, green **Results** Details Not Reported **EVALUATION** Domain Metric Rating Comments Domain 1: Substance Metric 1: Representativeness High Data are measured or estimated for the subject chemical substance. Metric 2: Appropriateness N/A Rating of this factor is not applicable to this kind of information. Domain 2: Test Reliability Metric 3: Reliability/Unbiased Medium There is no indication that the methodology for producing the information was biased (Method Objectivity) towards a particular product or outcome. Metric 4: Reliability/Analytical Method N/A Rating of this factor is not applicable to this kind of information. Domain 3: Other Metric 5: Databases High The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. **Overall Quality Determination** High

**PUBLIC RELEASE DRAFT - DO NOT CITE OR QUOTE** 

S		Ph	April 2024 sysical Form or	State HERO ID: 3970851 Table			
Study Citation:	IARC, (2012).	ARC Monographs on the evaluation of ca	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and			
OECD Harmonized	Physical Form	hysical Form or State					
HERO ID:	3970851						
	5770051			N			
Parameter		Data	EXTRACTIO				
CACDN and T M-4.		77526 66 Augustic -1:4-					
Caskin and Test Material	Juidalina	//550-00-4; actinoitie					
Solvent Reactivity Storage	and Stability	NR · NR · NR					
Radiolabel Source State a	and Purity	None: NR: solid: NR					
Results Value	and I unity	green					
Results Details		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other							
Boman 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
	The terms	ination	II:ab				

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

)S		Pł	April 2024 Ivsical Form or	State HERO ID: 3970851 Table: 10
Study Citation: OECD Harmonized Template:	IARC, (2012). anthophyllite). Physical Form	ARC Monographs on the evaluation of c or State	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability nd Purity	77536-68-6; tremolite none; not specified; none NR; NR; NR; NR None; NR; solid; NR white to pale green Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	Metric 1: Metric 2:	Representativeness Appropriateness	High N/A	Data are measured or estimated for the subject chemical substance. Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
Domain 2. Test Kelldolli	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
	Metric 6.	Models	N/A	Rating of this factor is not applicable to this kind of information.

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

April 2024 HERO ID: 3970851 Table: 11 of 12 Physical Form or State Asbestos **Study Citation:** IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite). **OECD Harmonized** Physical Form or State **Template: HERO ID:** 3970851 EXTRACTION Parameter Data CASRN and Test Material 77536-68-6; tremolite Confidentiality, Type, and Guideline none; not specified; none Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; solid; NR Results Value double chain silicate; brittle fibers **Results** Details Not Reported **EVALUATION** Domain Metric Rating Comments Domain 1: Substance Metric 1: Representativeness High Data are measured or estimated for the subject chemical substance. Metric 2: Appropriateness N/A Rating of this factor is not applicable to this kind of information. Domain 2: Test Reliability Metric 3: Reliability/Unbiased Medium There is no indication that the methodology for producing the information was biased (Method Objectivity) towards a particular product or outcome. Metric 4: Reliability/Analytical Method N/A Rating of this factor is not applicable to this kind of information. Domain 3: Other Metric 5: Databases High The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. **Overall Quality Determination** High

**PUBLIC RELEASE DRAFT - DO NOT CITE OR QUOTE** 

S		Ph	sysical Form or	State HERO ID: 3970851 Table: 1		
<u> </u>						
Study Citation: OECD Harmonized	IARC, (2012). anthophyllite). Physical Form	ARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite). Physical Form or State				
Template: HERO ID:	3970851					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		12001-28-4: crocidolite				
Confidentiality, Type, and	Guideline	none; not specified; none				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	None; NR; solid; NR				
Results Value		double chain silicate				
Results Details		Not Reported				
			EVALUATIO	Ň		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	N/A	towards a particular product or outcome. Rating of this factor is not applicable to this kind of information.		
				• AA		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Oueli	v Dotorm	ination	High			

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

Study Citation: OECD Harmonized	Le Bouffant, L. ( Physical Form or	Le Bouffant, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33. Physical Form or State					
HERO ID:	3084215						
			EXTRACTIO	N			
Parameter		Data					
CASRN and Test Material		12001-29-5; chrysotile					
Confidentiality, Type, and C	Guideline	None; Experimental; not applicable					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR Notes: NR					
Results Value		Solid					
Results Details		NR					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical's physical/chemical properties.			
Domain 2: Test Reliabil	itv						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other	Matula 5.	Detabases	TT: -h				
	Metric 5:	Databases	High	Data is from a publicity available and peer-reviewed source.			
	Metric 6:	wodels	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	y Determin	nation	High				

HERO ID: 3860485 Table: 1 of 5

Study Citation:	(2017). PubChe	m: Chrysotile.		
Template:	T Hysical Portific	J State		
HERO ID:	3860485			
		Ι	EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and	Guideline	none; not specified; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		White or greenish fibrous, odorless solid.		
Results Details		Not Reported		
		]	EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	itv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	

\* Related References: Source: OSHA Occupational Chemical DB (not a primary source)

HERO ID: 3860485 Table: 2 of 5

Study Citation: OECD Harmonized	(2017). PubChe Physical Form of	m: Chrysotile.				
Template:	T flystear Forme	n State				
HERO ID:	3860485					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	none; not specified; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR				
Results Value		White or greenish (chrysotile), blue (cro	ocidolite), or gray-gr	reen (amosite) fibrous, odorless solids.		
Results Details		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	Metric 1:	(Method Objectivity) Reliability/Analytical Method	N/A	Pating of this factor is not applicable to this kind of information		
	Metric 4.	Renability/Analytical Method	11//A	Kating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	t <b>y Determi</b>	nation	High			

\* Related References: Source: N/OSH-PocketGuide, OSHA Occupational Chemical DB (not a primary source)

Study Citation: OECD Harmonized	(2017). PubChe Physical Form o	m: Chrysotile. or State		
HERO ID:	3860485			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material	~ • • • •	12001-29-5; Chrysotile		
Confidentiality, Type, and C	Juideline	none; not specified; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		Curled sheet silicate, spiraled as helix	around central capil	lary; fibrous member of serpentine mineral group possessing rolled trioctahedral clay
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ity			
Domain 2. Test Kelldom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	meane 5.	(Method Objectivity)	Wiedrum	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination High				

\* Related References: Source: IARC. Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans. Geneva: World Health Organization, International Agency for Research on Cancer, 1972-PRESENT. (Multivolume work). Available at:http://monographs.iarc.fr/ENG/Classification/index.php , p. V14 12 (1977) (not a primary source)

HERO ID: 3860485 Table: 4 of 5

Study Citation: OECD Harmonized	(2017). PubChen Physical Form or	n: Chrysotile. · State		
HERO ID:	3860485			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability nd Purity	12001-29-5; Chrysotile none; not specified; Not Reported NR; NR; NR; NR NR; NR; NR Notes: NR White, grey, green or yellowish fibrous Not Reported	s solid.	
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Other				
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination				

\* Related References: Source: ILO-ICSC (not a primary source)

HERO ID: 3860485 Table: 5 of 5

Study Citation:	(2017). PubChe	em: Chrysotile.				
OECD Harmonized	Physical Form of	or State				
HFRO ID:	3860485					
	5000-05					
Donomotor	EXTRACTION					
Parameter		Data				
CASPN and Test Material		12001 20 5: Chrysotile				
Confidentiality Type and (	Guideline	none: not specified: Not Reported				
Solvent Reactivity Storage	and Stability	NR· NR· NR				
Radiolabel, Source, State, a	and Purity	NR: NR: NR Notes: NR				
Results Value		Crystal system: monoclinic (pseudoorth	horhombic): usually	white to gravish green; may have tan coloration.		
Results Details		Not Reported	,			
		-				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabil	ity					
Domain 2. Tost Renaon	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	y Determi	nation	High			

\* Related References: Source: Kirk-Othmer Encyclopedia of Chemical Technology. 4th ed. Volumes 1: New York, NY. John Wiley and Sons, 1991-Present., p. V3 (1992) 671 (not a primary source)

HERO ID: 3860486 Table: 1 of 2

Study Citation: OECD Harmonized	(2017). PubChe Physical Form o	m: Crocidolite. or State		
Template: HERO ID:	3860486			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-28-4; crocidolite		
Confidentiality, Type, and C	Guideline	none; experimental; not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; solid; NR Notes: NA		
Results Value		solid		
Results Details		lavender, blue or greenish, fibrous solid		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	itv			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Demain 2. Other				
Domain 5: Other	Matric 5:	Databasas	High	The information or data is from a recognized data collection/repository where data are
	with it 3.	DataUases	nigil	peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	

\* Related References: Citing ILO-ICSC.

HERO ID: 3860486 Table: 2 of 2

Study Citation: OECD Harmonized	(2017). PubChen Physical Form or	n: Crocidolite. · State		
HERO ID:	3860486			
		_	EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Value Results Details	Guideline e, and Stability nd Purity	12001-28-4; crocidolite none; experimental; not reported NR; NR; NR; NR NR; NR; solid; NR Notes: NA solid blue fibrous, odorless solid		
			EVALUATIO	
Domain		Metric	Rating	Comments
Domain 1: Substance	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determin	ation	High	

\* Related References: Citing OSHA Occupational Chemical DB.

HERO ID: 3860489 Table: 1 of 1

Study Citation:	(2016). Agent n	name: Anthophyllite.				
<b>OECD Harmonized</b>	Physical Form of	or State				
Template:						
HERO ID:	3860489					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material		17068-78-9; Anthophyllite				
Confidentiality, Type, and C	Guideline	None; experimental; Not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR Notes: NR				
Results Value		Gray, white, brown-gray, or green solid	; White or gray fibro	bus solid		
Results Details		Fibrous mineral				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other	Matria 5.	Detahagag	Iliah			
	Metric 5:	Databases	nigii	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	ty Determi	nation	High			

\* Related References: IARC and SPI MSDS

HERO ID: 3982328 Table: 1 of 6

Study Citation:	NIH, (2016). Re	port on carcinogens: Asbestos.			
OECD Harmonized	Physical Form of	r State			
Template:					
HERO ID:	3982328				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		1332-21-4; actinolite			
Confidentiality, Type, and	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; Not Reported; solid; NR Notes: con	nmon contaminant	in amosite deposits	
Results Value		brittle fibers			
Results Details		pale to dark green			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabil	ity				
20muni 2. 105t Rendom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	metric 5.	(Method Objectivity)	meanum	towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	Hıgh	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
	D.4	<b>4</b> •	TT! _ 1		
Overall Quality	ty Determin	nation	High		

\* Related References: Cited sources (multiple sources cited) - IARC 1977, IPCS 1986

HERO ID: 3982328 Table: 2 of 6

Study Citation	NILL (2016) De	mort on oproinogance Ashastas			
OFCD Harmonized	Physical Form of	r State			
Template:	i nysicai i onn o	1 State			
HERO ID:	3982328				
			EXTRACTIO	 N	
Parameter		Data			
CASRN and Test Material		1332-21-4; tremolite			
Confidentiality, Type, and	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; Not Reported; solid; NR Notes: co	mmon contaminant	in chrysotile and talc deposits	
Results Value		brittle fibers			
Results Details		white to gray			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabil	ity				
Domain 2. Test Rendom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other	Matria 5.	Detchasse	II: -1		
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
			TT. 1		
Overall Qualit	ty Determi	nation	High		

\* Related References: Cited sources (multiple sources cited) - IARC 1977, IPCS 1986

HERO ID: 3982328 Table: 3 of 6

Study Citation:	NIH, (2016). Re	port on carcinogens: Asbestos.				
OECD Harmonized	Physical Form o	r State				
Template:						
HERO ID:	3982328					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		1332-21-4; amosite				
Confidentiality, Type, and C	Guideline	none; not specified; not specified				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; solid; NR				
Results Value		solid fibers, long, straight, coarse, som	ewhat flexible			
Results Details		ash gray, greenish, or brown				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Demain 2. Test Delishil	·					
Domain 2: Test Renabili	Ily Matria 2.	Daliability/Unbiased	Madium	The second se		
	Metric 3:	(Mathad Objectivity)	Medium	I here is no indication that the methodology for producing the information was biased		
	Metric 1.	(Method Objectivity) Reliability/Analytical Method	N/A	Pating of this factor is not applicable to this kind of information		
	Metrie 4.	Renability/Analytical Method	11/74	Rating of this factor is not appreable to this kind of mormation.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are		
			-	peer-reviewed by experts in the field, are broadly available to the public for review.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	Overall Ouality Determination High					
<b>L</b>	v		8			

\* Related References: Cited sources (multiple sources cited) - IARC 1973, 1977, IPCS 1986

HERO ID: 3982328 Table: 4 of 6

Study Citation:	NIH (2016) R	eport on carcinogens: Ashestos				
OECD Harmonized	Physical Form of	or State				
Template:	1 11 9 510 41 1 01111 0					
HERO ID:	3982328					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material		1332-21-4; chrysotile				
Confidentiality, Type, and C	Guideline	none; not specified; not specified				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; occurs naturally; solid; NR Notes:	composition: Mg3S	5i2O5(OH)4		
Results Value		solid; curled sheet silicate, which wraps	s around itself formi	ng hollow tubular fibers		
Results Details		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance		<b>D</b>				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabil	itv					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are		
				peer-reviewed by experts in the field, are broadly available to the public for review.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	Overall Quality Determination High					
<b>`</b>	v		0			

\* Related References: Cited sources (multiple sources cited) - IARC 1973, 1977, IPCS 1986

HERO ID: 3982328 Table: 5 of 6

Study Citation:	NIH, (2016). Re	port on carcinogens: Asbestos.					
OECD Harmonized	Physical Form of	r State					
Template:							
HERO ID:	3982328						
			EXTRACTIO	N			
Parameter		Data					
CASRN and Test Material		1332-21-4; anthophyllite					
Confidentiality, Type, and C	Guideline	none; not specified; not specified					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; Not Reported; solid; NR Notes: occasionally occurs as a contaminant in talc deposits					
Results Value		solid fibers, short, very brittle					
Results Details		grayish white, brown-gray, or green					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
	•,						
Domain 2: Test Reliabili	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	Matria 4:	(Method Objectivity) Reliability/Analytical Mathod	NI/A	Dating of this factor is not emplicable to this kind of information			
	Meuric 4.	Reliability/Allarytical Method	IN/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are			
			-	peer-reviewed by experts in the field, are broadly available to the public for review.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	Overall Quality Determination High						
	•		3				

\* Related References: Cited sources (multiple sources cited) - IARC 1973, 1977, IPCS 1986

HERO ID: 3982328 Table: 6 of 6

Study Citation:	NIH, (2016). Re	port on carcinogens: Asbestos.			
OECD Harmonized	Physical Form of	r State			
Template:	5				
HERO ID:	3982328				
			EXTRACTIO	 N	
Parameter		Data			
CASRN and Test Material		1332-21-4; crocidolite			
Confidentiality, Type, and C	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; solid; NR			
Results Value		shorter, thinner fibers compared to othe	r amphiboles; not as	thin as chrysotile	
Results Details		lavender or blue; good flexibility and fa	air spinnability		
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2. Tost Daliabil	:4				
Domain 2: Test Kellabil	ILY		Malium		
	Metric 3:	(Mathad Objectivity)	Medium	I here is no indication that the methodology for producing the information was biased	
	Matric 4:	(Method Objectivity) Reliability/Analytical Method	N/A	Bating of this factor is not applicable to this kind of information	
	Metric 4.	Renability/Analytical Method	IV/A	Kating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are	
			C C	peer-reviewed by experts in the field, are broadly available to the public for review.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	Overall Quality Determination High				
<u> </u>	v		0		

\* Related References: Cited sources (multiple sources cited) - IARC 1973, 1977, IPCS 1986

HERO ID: 192177 Table: 1 of 1

Study Citation:	NIOSH, (2007) Physical Form (	. NIOSH pocket guide to chemical haza	rds.				
Template.	Filysical Follin	51 State					
HERO ID:	192177						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		1332-21-4; Asbestos	1332-21-4; Asbestos				
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR Notes: NR					
Results Value		White or greenish (chrysotile), blue (cre	ocidolite), or gray-gr	een (amosite); fibrous, odorless solids			
Results Details		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	itv						
20114111 21 1000 10014014	Metric 3:	Reliability/Unbiased	N/A	Rating of this factor is not applicable to this kind of information.			
		(Method Objectivity)					
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other							
	Metric 5:	Databases	Medium	The data are from a source that is known but is missing elements required for High designation such as peer-review, public availability, or the inclusion of references to original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Quality Determination</b>			High				

Study Citation: OECD Harmonized	NIOSH, (2016) Physical Form	). NIOSH pocket guide to chemical haza or State	ards: Asbestos.					
Template: HERO ID:	3974865							
	EXTRACTION							
Parameter		Data						
CASRN and Test Material	~	1332-21-4; Asbestos	1332-21-4; Asbestos					
Confidentiality, Type, and C	Juideline	None; Experimental; None						
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR						
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR						
Results Value		Fibrous, odorless solids. White or gree	enish (chrysotile), blu	e (crocidolite), or gray-green (amosite).				
Results Details		Not Reported						
	EVALUATION							
Domain		Metric	Rating	Comments				
Domain 1: Substance			-					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.				
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features (e.g., presence of certain functional groups) and/or other physical/chemical properties.				
Domain 2: Test Reliabil	ity							
	Metric 3:	Reliability/Unbiased (Method Objectivity)	N/A	Rating of this factor is not applicable to this kind of information.				
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.				
Domain 3: Other								
	Metric 5:	Databases	Medium	The data are from a source that is known but is missing elements required for High designation such as peer-review, public availability, or the inclusion of references to original sources.				
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.				
<b>Overall Qualit</b>	Overall Quality Determination High							

\* Related References: None cited.

Study Citation:	NIOSH, (2014).	International chemical safety cards (ICI	DC): Chrysotile.		
Template.	r nysicai ronni o	1 State			
HERO ID:	3978149				
			EXTRACTIO	N	
Parameter		Data	EATRACIIO	11	
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR Notes: NR			
Results Value		White, grey, green or yellowish fibrous s	solid		
Results Details		None			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2. Other					
Domain 5. Ouler	Metric 5	Databases	High	Date is from a publicly available and peer reviewed database	
	Metric 6	Models	N/A	Rating of this factor is not applicable to this kind of information	
	incure o.		1.1/21	rading of this factor is not upprease to this kind of information.	
<b>Overall Qualit</b>	ty Determin	nation	High		

Study Citation: OECD Harmonized	NIOSH, (2014) Physical Form of	. International chemical safety cards (IC or State	CDC): Crocidolite.	
Template:				
HERO ID:	3978150			
			EXTRACTIO	N
Parameter		Data		
CASEN and Test Material		12001 28 4: Creatidalita		
Confidentiality Type and (	Guideline	None: Experimental: None		
Solvent Reactivity Storage	and Stability	NR · NR · NR		
Radiolabel, Source, State, a	and Purity	NR: NR: NR NR Notes: riebeckite		
Results Value		Reported as Fibres		
Results Details		Blue asbestos		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical's physical/chemical properties.
Domain 2. Test Reliabil	itv			
2	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	Matria 5.	Detabases	II: -1	
	Metric 5:	Databases	High	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

Study Citation: OECD Harmonized	NIOSH, (2019). NIOSH pocket guide to chemical hazards: Asbestos. Physical Form or State					
Template:	2					
HERO ID:	9109830					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		1332-21-4; Asbestos				
Confidentiality, Type, and C	Guideline	none; not specified; not specified				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: Hydrated mine	eral silicates			
Results Value		solid				
Results Details		White or greenish (chrysotile), blue (cro	cidolite), or gray-gr	reen (amosite) fibrous, odorless solids.		
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Data are consistent with the subject chemical substance structural features.		
Domain 2: Test Paliability						
Domain 2. Test Renadi	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	Matria 4	(Method Objectivity) Reliability/Analytical Mathod	NI/A	lowards a particular product or outcome.		
	Metric 4:	Reliability/Allarytical Method	IN/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	Overall Quality Determination High					

\* Related References: Primary reference not reported in this secondary source.
**Results Details** 

Study Citation:	U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System						
OECD Harmonized	Physical Form or S	Physical Form or State					
Template: HERO ID:	3827272						
		EXTRACTION					
Parameter		Data					
CASRN and Test Material		1332-21-8; Libby amphibole					
Confidentiality, Type, and	Guideline	none; Experimental; not specified					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; NR Notes: NR					
Results Value		Surface area (m2/g): 1.1-7.4					

Elongated mineral particle surface area by transmission electron microscopy (m2/g): 1.1-2.6; Total surface area by gas adsorption (m2/g): 5.3-7.4

			EVALUATION					
Domain		Metric	Rating	Comments				
Domain 1: Substance								
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.				
	Metric 2:	Appropriateness	High	Measured data are consistent with subject chemical structural features.				
Domain 2: Test Reliab	ility							
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.				
	Metric 4:	Reliability/Analytical Method	High	Data are obtained using accepted standard analytical methods.				
Domain 3: Other								
	Metric 5:	Databases	High	The data are from a publicly available secondary source with reference to the original sources.				
	Metric 6:	Models	N/A	The metric is not applicable to the study type.				
<b>Overall Quality Determination</b>			High					

\* Related References: Duncan, KE; Cook, PM; Gavett, SH; Dailey, LA; Mahoney, RK; Ghio, AJ; Roggli, VL; Devlin, RB. (2014). In vitro determinants of asbestos fiber toxicity: effect on the relative toxicity of Libby amphibole in primary human airway epithelial cells. Part Fibre Toxicol 11. http://dx.doi.org/10.1186/1743-8977-11-2

Study Citation:	U.S. EPA, (2014).	Toxicological review of libby amphib	oole asbestos: I	n support of summary information on the Integrated Risk Information System
OECD Harmonized	(IRIS). Physical Form or S	tate		
Template:	2027272			
HERO ID:	3827272			
_		]	EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		1332-21-8; Libby amphibole		
Confidentiality, Type, and C	Juideline	none; Experimental; not specified		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
Results Value		Essential composition: Winchite (84%), ric	chterite (11%), ar	d tremolite (6%).
Results Details		Mineral composition of individual fiber str	uctures was deter	mined using EDS and electron probe microanalysis.
			EVALUATION	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	The metric is not applicable to the study type.
Domain 2: Test Reliabili	ty			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)	c	tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained using accepted standard analytical methods.
D : 0.01				
Domain 3: Other	N		TT: 1	
	Metric 5:	Databases	High	The data are from a publicly available secondary source with reference to the original sources.
	Metric 6:	Models	N/A	The metric is not applicable to the study type.
<b>Overall Qualit</b>	y Determina	ition	High	

\* Related References: Meeker, GP; Bern, AM; Brownfield, IK; Lowers, HA; Sutley, SJ; Hoefen, TM; Vance, JS. (2003). The composition and morphology of amphiboles from the Rainy Creek Complex, near Libby, Montana. Am Mineral 88: 1955-1969.

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3827272 Table: 3 of 6

Study Citation:	U.S. EPA, (2014)	. Toxicological review of libby ampl	nibole asbestos: In suj	oport of summary information on the Integrated Risk Information System
OECD Harmonized	(IRIS). Physical Form or	Physical Form or State		
HERO ID:	3827272			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		77536-66-4; actinolite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		Straight to curved fibers and bundles.		
Results Details		Colorless to pale green.		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	Medium	The data are from a source that is known but is missing elements required for High designation such as peer-review, public availability, or the inclusion of references to original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	ation	Medium	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3827272 Table: 4 of 6

Study Citation:	U.S. EPA, (2014)	. Toxicological review of libby ampl	nibole asbestos: In sup	oport of summary information on the Integrated Risk Information System
OECD Harmonized	(IRIS). Physical Form or	Physical Form or State		
HERO ID:	3827272			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		77536-68-6; tremolite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		Straight to curved fibers and bundles.		
Results Details		Colorless to pale green.		
Domain		Matria	EVALUATION	Commonts
Domain 1: Substance		Metric	Katilig	Comments
Domain 1. Substance	Metric 1	Representativeness	High	Data are measured or estimated for the subject chemical substance
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
	Metrie 2.	rippiopriateness	Ingh	measured data are consistent with the subject enclinear substance subctular reactions.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	Medium	The data are from a source that is known but is missing elements required for High designation such as peer-review, public availability, or the inclusion of references to original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determin	ation	Medium	

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3827272 Table: 5 of 6

Study Citation:	U.S. EPA, (2014).	Toxicological review of libby ampl	hibole asbestos: In sup	oport of summary information on the Integrated Risk Information System
OECD Harmonized	Physical Form or State			
HERO ID:	3827272			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		17068-76-7; richterite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
Results Value		Straight to curved fibers and bundles.		
Results Details		Colorless, pale yellow, brown, pale to da	ark green, or violet.	
Domain		Metric	EVALUATION Rating	Comments
Domain 1: Substance		Weute	Rating	connients
2 onium 11 Substance	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Matric 1.	(Method Objectivity) Reliability/Analytical Method	Low	towards a particular product or outcome.
	Metric 4.	Kenability/Analytical Method	Low	used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determina	ation	Medium	

\* Related References: Deer and Zussman (1997) Rock Forming Minerals Volume 2B: Double Chain Silicates, 2nd Edition. The Geological Society, London. HERO ID 2079162

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3827272 Table: 6 of 6

Study Citation:	U.S. EPA, (2014)	. Toxicological review of libby ampl	nibole asbestos: In sup	oport of summary information on the Integrated Risk Information System
OECD Harmonized	(IRIS). Physical Form or	Physical Form or State		
HERO ID:	3827272			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12425-92-2; winchite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		Straight to curved fibers and bundles.		
Results Details		Colorless to pale blue.		
Demain		Martinia	EVALUATION	Comments
Domain Domain 1, Substance		Metric	Kating	Comments
Domain 1. Substance	Matric 1.	Depresentativeness	High	Data are measured or estimated for the subject chemical substance
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance,
	Methe 2.	Appropriateness	Ingn	Weasured data are consistent with the subject enclinear substance structurar reatures.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	Medium	The data are from a source that is known but is missing elements required for High designation such as peer-review, public availability, or the inclusion of references to original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determin	ation	Medium	

HERO ID: 3975020 Table: 1 of 4

Study Citation:	USGS, (2002).	Asbestos: Geology, mineralogy, mining,	and uses.	
<b>OECD Harmonized</b>	Physical Form o	or State		
Template:				
HERO ID:	3975020			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and	Guideline	None; Experimental; NR		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value	·	Color: usually white to grayish green; m	ay have tan colorat	ion
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	

\* Related References: No citation given.

Asbestos

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3975020 Table: 2 of 4

Study Citation: OECD Harmonized	USGS, (2002). A Physical Form o	Asbestos: Geology, mineralogy, mining r State	, and uses.	
HERO ID:	3975020			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	Guideline	None; Experimental; NR		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
Results Value		Color: Cobalt blue to lavender blue		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	nation	High	

\* Related References: No citation given.

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3975020 Table: 3 of 4

Study Citation: OECD Harmonized	USGS, (2002). A Physical Form o	Asbestos: Geology, mineralogy, mining, r State	and uses.	
Template:				
HERO ID:	3975020			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and C	Guideline	None; Experimental; NR		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		Color: Yellowish gray to dark brown		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Demain 2. Test Delishil	·			
Domain 2: Test Renabili	Ily Matria 2:	Paliability/Upbiasad	Madium	There is no indication that the methodology for producing the information was biased
	Metric 5:	(Method Objectivity)	Medium	towards a particular product or outcome
	Metric 4.	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
	Medie 1.	Rendomity// mary tear Wethod	Wiedduin	inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

\* Related References: No citation given.

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

Study Citation: OECD Harmonized	USGS, (2002). A Physical Form or	sbestos: Geology, mineralogy, mining, State	and uses.	
HERO ID:	3975020			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		14567-73-8; Tremolite		
Confidentiality, Type, and C	Guideline	None; Experimental; NR		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
Results Value		Color: Gray-white, green, yellow, blue		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Tost Daliahili				
Domain 2: Test Renadin	lly Matria 21	Delichility/Unbiased	Madium	There is no indication that the mostly deltage for my desire the information much include
	Metric 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome
	Metric 4.	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
	Wettle 4.	Renability// marytical Wethod	Wiedrum	inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other	M ( 1 5			
	Metric 5:		N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>		High		

\* Related References: No citation given.

HERO ID: 3859385 Table: 1 of 4

Study Citation:	Virta, R. L. (200 Physical Form (	04). Asbestos. 3:288-319.		
Template:	Fliysical Follin	5 State		
HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		vitreous to pearly luster; coarse but som	newhat pliable textur	re
Results Details		yellowish gray to dark brown		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain 5. Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
	Metric 5.	Databases	Ingn	peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination H				

Asbestos

HERO ID: 3859385 Table: 2 of 4

Study Citation: OECD Harmonized	Virta, R. L. (200 Physical Form o	4). Asbestos. 3:288-319. r State		
Template:	i nysicai i onn o	i State		
HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material	~	12001-28-4; crocidolite		
Confidentiality, Type, and C		none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radioladel, Source, State, a	ind Purity	silky to dull luster: soft to barsh texture		
Results Details		cobalt blue to lavender blue		
Results Details				
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ity.			
Domain 2, Test Kellauli	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	metric 5.	(Method Objectivity)	Weatani	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determi	nation	High	

HERO ID: 3859385 Table: 3 of 4

Study Citation:	Virta, R. L. (200	04). Asbestos. 3:288-319.		
OECD Harmonized	Physical Form (	or State		
HERO ID:	3859385			
	2027202			
Donomotor		Data	EXTRACTIO	N
Parameter		Data		
CASRN and Test Material	a	14567-73-8; tremolite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results value		silky luster; generally harsh texture		
Results Details		gray-white, green, yellow, blue		
				-
D .			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	M 1		TT' 1	
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	M		TT' 1	
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

HERO ID: 3859385 Table: 4 of 4

Study Cutation:       Prior Num YC (2007) Processors (2007) Pr	Study Citation:	Virta P. I. (200	(A)  A  shestor  3.288-310		
Dot to the model       Project Point of State         HERO ID:       3859385         Parameter       Data         CASRN and Test Material       12001-29-5; chrysotile         confidentiality, Type, and Guideline       none; not specified; not specified         Solvent, Reactivity, Storage, and Stability       NR; NR; NR Note: NR         Results Value       silky loster; silky, soft to harsh texture         Results Value       motif to grayish green; may have tan coloration         Domain       Metric       Representativeness         High       Data are measured or estimated for the subject chemical substance.         Metric 1:       Representativeness       High       Data are measured or estimated for the subject chemical substance.         Domain 1: Substance       Metric 2:       Appropriateness       High       Measured data are consistent with the subject chemical substance.         Domain 2: Test Reliability/       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are provided to various.         Domain 3: Other       Metric 6:       Models       N/A       Rating of this factor is not applicable to t	OECD Harmonized	Physical Form of	nr State		
HERO ID:       3859385         Parameter       Data         CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity Results Value       12001-29-5; chrysotile none: not specified; not specified none: not specified; not specified none: not specified; not specified solvent, Reactivity, Storage, and Stability NR: NR: NR: NR         Domain       NR: NR: NR: NR Sults Value         Domain 1: Substance Metric 1:       Representativeness Appropriateness         Metric 2:       Appropriateness         High Metric 4:       Reliability/Unbiased (Method Objectivity) Metric 4:       Medium Reliability/Unbiased (Method Objectivity) NR       Medium NR         Domain 3: Other       Metric 5:       Databases         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Template:	i nysiou i oim e	, State		
Parameter       Data         CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity Radiolabel, Source, State, and Purity Results Value Results Value Metric 1:       12001-29-5; chrysotile none: not specified, not specified NR; NR; NR; NR NR NR; NR; NR; NR NR toture NR Silly Uster; Silky, Soft to harsh texture white to grayish green; may have tan coloration         Domain       Metric       Retric       Comments         Domain 1: Substance Metric 2:       Metric       Representativeness High       Data are measured or estimated for the subject chemical substance. Metric 2:         Domain 2: Test Reliability Metric 4:       Reliability/Unbiased (Method Objecitivity) Metric 4:       Medium Reliability/Analytical Method       There is no indication that the methodology for producing the information was biased towards a particular product or outcome. Rating of this factor is not applicable to this kind of information.         Domain 3: Other       Metric 5:       Databases       High High       The information of data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.	HERO ID:	3859385			
Parameter         Data           CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity Results Value Results Value Metric Otalis         12001-29-5; chrysotile none; not specified; not specified NR; NR; NR; NR NN to the specified; NR; NR; NR; NR NN to the shark texture white to grayish green; may have tan coloration           Domain         Metric C         Rating           Domain 1: Substance Metric 2:         Appropriateness         High Metric 2:         Data are measured or estimated for the subject chemical substance. Metric 2:           Domain 2: Test Reliability Metric 4:         Reliability/Unbiased (Method Objectivity)         Medium NA: Reliability/Analytical Method         There is no indication that the methodology for producing the information was biased towards a particular product or outcome. Metric 4:           Domain 3: Other         Metric 5:         Databases         High Metric 6:         The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.				EVTDACTIO	AT
Taraneter       Data         CASRN and Test Material       12001-29-5; chrysotile         Confidentiality, Type, and Guideline       none: not specified:         Solvent, Reactivity, Storage, and Stability       NR; NR; NR         Radiotabel, Source, State, and Purity       NR; NR; NR NR         Results Value       silky luster; silky, soft to harsh texture         white to grayish green; may have tan coloration       silky luster; silky, soft to harsh texture         Domain       Metric       Rating         Comments       Comments         Domain 1: Substance       Metric 1:       Representativeness         Metric 2:       Appropriateness       High       Data are measured or estimated for the subject chemical substance.         Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Doromotor		Data	EATRACIIO	
CASRN and Test Material       12001-29-5; chrysotile         Confidentiality, Type, and Guideline       none; not specified; not specified;         Solvent, Reactivity, Storage, and Stability       NR; NR; NR; NR         NR; NR; NR; NR; NR Notes: NR       NR; NR; NR; NR Notes: NR         sikubulae       NR; NR; NR; NR Notes: NR         mesults Value       white to grayish green; may have tan coloration         Domain       Metric         Metric       Representativeness         High       Data are measured or estimated for the subject chemical substance.         Metric 1:       Representativeness         Metric 2:       Appropriateness         High       Data are consistent with the subject chemical substance chemical substance.         Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium         Metric 4:       Reliability/Analytical Method       N/A         Reliability/Analytical Method       N/A       Rating of this factor is not applicable to this kind of information.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are pre-reviewed by experts in the field, are broadyl available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.<			Data		
CASIN and lest Material 12001-29-5; chrysotile none; not specified not s					
Contidentiality, type, and Guideline       none; not specified; not specified;         Solvent, Reactivity, Storage, and Stability       NR; NR; NR; NR         Radiolabel, Source, State, and Purity       NR; NR; NR; NR         Results Value       silky luster; silky, soft to harsh texture         white to grayish green; may have tan coloration         Domain       Metric         Results Details       Metric         Results Details       Metric         Results Details       Metric 1:         Representativeness       High         Domain 1: Substance       Metric 2:         Metric 2:       Appropriateness         High       Data are measured or estimated for the subject chemical substance.         Metric 3:       Reliability/Unbiased (Method Objectivity)         Metric 4:       Reliability/Analytical Method         N/A       Rating of this factor is not applicable to this kind of information.         Domain 3: Other       Metric 5:         Metric 6:       Models         Metric 6:       Models	CASRN and Test Material	<b>7</b> • 1 1•	12001-29-5; chrysotile		
Solvent, Reactivity, Storage, and Stability       NR; NR; NR         Radiolabel, Source, State, and Purity       NR; NR; NR; NR Notes: NR         Results Value       silky luster; silky, soft to harsh texture         Results Value       white to grayish green; may have tan coloration         Domain       Metric         Representativeness       High         Metric 1:       Representativeness         Metric 2:       Appropriateness         High       Data are measured or estimated for the subject chemical substance.         Metric 2:       Appropriateness         High       Measured data are consistent with the subject chemical substance structural features.         Domain 2: Test Reliability       Metric 3:         Metric 4:       Reliability/Unbiased (Method Objectivity)       Medium         Metric 4:       Reliability/Analytical Method       N/A         Rating of this factor is not applicable to this kind of information.       Domain 3: Other         Domain 3: Other       Metric 6:       Models       N/A	Confidentiality, Type, and C	Juideline	none; not specified; not specified		
Radiolabel, Source, State, and Purity       NR; NR; NR; NR Notes: NR         Results Value       silky luster; silky, soft to harsh texture         Results Details       white to grayish green; may have tan coloration         Domain       Metric         Representativeness       High         Domain 1: Substance       Metric 1:         Metric 2:       Appropriateness         Metric 3:       Reliability/Unbiased (Metric 4:         Metric 4:       Reliability/Unbiased (Method Objectivity)         Metric 4:       Reliability/Analytical Method         Domain 3: Other       Metric 5:         Metric 6:       Models	Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Results Value       silky luster; silky, soft to harsh texture         Results Details       white to grayish green; may have tan coloration         Domain       EVALUATION         Domain 1: Substance       EVALUATION         Metric 1:       Representativeness       High       Data are measured or estimated for the subject chemical substance.         Metric 2:       Appropriateness       High       Measured data are consistent with the subject chemical substance structural features.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Radiolabel, Source, State, a	ind Purity	NR; NR; NR; NR Notes: NR		
Results Details       white to grayish green; may have tan coloration         EVALUATION         Domain       Metric       Rating       Comments         Domain 1: Substance       Metric 1:       Representativeness       High       Data are measured or estimated for the subject chemical substance.         Metric 2:       Appropriateness       High       Data are consistent with the subject chemical substance structural features.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Results Value		silky luster; silky, soft to harsh texture		
Domain       Metric       EVALUATION Rating       Comments         Domain 1: Substance       Metric 1: Metric 2:       Representativeness Appropriateness       High High       Data are measured or estimated for the subject chemical substance. High       Measured data are consistent with the subject chemical substance structural features.         Domain 2: Test Reliability Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium N/A       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       High High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Results Details		white to grayish green; may have tan co	oloration	
EVALUATIONDomainMetricRatingCommentsDomain 1: SubstanceMetric 1:RepresentativenessHighData are measured or estimated for the subject chemical substance.Metric 2:AppropriatenessHighData are measured or estimated for the subject chemical substance.Domain 2: Test ReliabilityMetric 3:Reliability/Unbiased (Method Objectivity)MediumMetric 4:Reliability/Analytical MethodN/ARating of this factor is not applicable to this kind of information.Domain 3: OtherMetric 5:DatabasesHighThe information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.Metric 6:ModelsN/ARating of this factor is not applicable to this kind of information.					
Domain       Metric       Rating       Comments         Domain 1: Substance       Metric 1:       Representativeness       High       Data are measured or estimated for the subject chemical substance.         Metric 2:       Appropriateness       High       Data are measured or estimated for the subject chemical substance.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.				EVALUATIO	N
Domain 1: Substance       Metric 1:       Representativeness       High       Data are measured or estimated for the subject chemical substance.         Metric 2:       Appropriateness       High       Data are measured or estimated for the subject chemical substance.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Domain		Metric	Rating	Comments
Metric 1:       Representativeness       High Metric 2:       Data are measured or estimated for the subject chemical substance.         Domain 2:       Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3:       Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Domain 1: Substance				
Metric 2:       Appropriateness       High       Measured data are consistent with the subject chemical substance structural features.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       N/A       Rating of this factor is not applicable to this kind of information.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.		Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       N/A       Rating of this factor is not applicable to this kind of information.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.		Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliability/       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       N/A       Rating of this factor is not applicable to this kind of information.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Domain 2: Tost Dalishil	<b>1 1 1</b>			
Metric 3:       Refrability/Orbitased (Method Objectivity)       Metric 4:       Reliability/Analytical Method       N/A       Rating of this factor is not applicable to this kind of information.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Domain 2: Test Kenaon	Motrio 2:	Paliability/Unbiased	Madium	These is no indication that the methodology for mechanics the information was biased
Metric 4:       Reliability/Analytical Method       N/A       Rating of this factor is not applicable to this kind of information.         Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.		Meure 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.
Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.		Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other       Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.					
Metric 5:       Databases       High       The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Domain 3: Other				
Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.		Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
Metric 6:     Models     N/A     Rating of this factor is not applicable to this kind of information.					peer-reviewed by experts in the field, are broadly available to the public for review and
Metric 6:ModelsN/ARating of this factor is not applicable to this kind of information.					use.
		Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Overlity Determination Uish	Overall Over	The township		II:ch	
Overall Quality Determination High	Overall Qualit	y Determi	nauon	High	

Study Citation:	Xu, X. M., Li, Y. Ferroelectrics 1880	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated Ferroelectrics 188(1):136-147.				
<b>OECD Harmonized</b>	Physical Form or S	State				
Template:						
HERO ID:	6860096					
		E	XTRACTIO	N		
Parameter		Data				
CASRN and Test Material		1332-21-4; Asbestos				
Confidentiality, Type, and C	Guideline	None; not specified; NA				
Solvent, Reactivity, Storage	, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; Health and Safety Laboratory, UK and	KTR laboratory	, South Korea; Solid; NR Notes: Asbestos-standard sample		
Results Value		Fiber				
Results Details		Edge color of fiber white, amaranth/orange/	yellow, purple,	blue/blue-green, white		
		Е	VALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ty					
	Metric 3:	Reliability/Unbiased	N/A	Rating of this factor is not applicable to this kind of information.		
		(Method Objectivity)				
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	Overall Quality Determination High					

Study Citation: OECD Harmonized	Elsevier, (2021) Physical Form (	). Reaxys: physical-chemical property date	ata for Chrysotile.				
Template:	,						
HERO ID:	7924810						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		12001-29-5; Chrysotile					
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR					
Results Value		5 values in Reaxys - crystal phase: Fibe	rs (3), needles (1) O	Octahedrons (1)			
Results Details		Not Reported					
Domain		Metric	Rating	Comments			
Domain 1: Substance			-				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	ity						
2	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Qualit	v Determi	nation	High				

\* Related References: Thermochimica Acta 1984; Gmelin Handbuch der Anorganischen Chemie vol. Cr: MVol.A1, 3.5.3; Fortschritte der Mineralogie 1934; Ipatieff et al. Bulletin de la Societe Chimique de France 1927; Journal of Alloys and Compounds 2008

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924810 Table: 2 of 2

Study Citation:	Elsevier, (2021)	. Reaxys: physical-chemical property da	ata for Chrysotile.			
OECD Harmonized	Physical Form of	or State				
Template:						
HERO ID:	7924810					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR				
Results Value		3 values reported in Reaxys - Crystal sy	stem: monoclinic, r	hombic, and hexagonal		
Results Details		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2. Test Reliabil	ity					
Domain 2. Tost Reliabil	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)	1.10010111	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	Overall Quality Determination High					
Sterian Zuan						

\* Related References: Gmelin Handbuch der Anorganischen Chemie; vol. Mg: MVol.A1; 2.8, page 102 - 110; Wang, Xun; Zhuang, Jing; Chen, Jun; Zhou, Kebin; Li, Yadong; Angewandte Chemie - International Edition; vol. 43; nb. 15; (2004); p. 2017 - 2020

Study Citation: OECD Harmonized	Elsevier, (2021) Physical Form of	). Reaxys: physical-chemical property data for State	ata for Anthophyl	lite.
Template: HERO ID:	7924812			
			EXTRACTIO	N
Parameter		Data		
CASDN and Test Material		17060 78 0. Anthony 11:10		
Confidentiality Type and (	Guideline	17008-78-9; Anthophyline None: Experimental: Not Reported		
Solvent Reactivity Storage	and Stability	NR· NR· NR		
Radiolabel Source State a	and Purity	NR: NR: Solid: NR		
Results Value	and I unity	2 values reported in Reaxys - Crystal pl	nase: needles, prism	8
Results Details		Not Reported		
<b>D</b> .			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain I: Substance	Matria 1.	D	II: -1-	
	Metric 1: Matria 2:	Appropriatopass	Hign N/A	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	IN/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3. Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	

\* Related References: Walitzi, E. M.; Walter, F.; Ettinger, K.; Zeitschrift fur Kristallographie; ; vol. 188; (1989); p. 237 - 244

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

Study Citation:	Elsevier (2021)	Reavys: physical chemical property d	ata for Anthonhyll	lita
OECD Harmonized	Physical Form	or State	ata ior Anthophyn	ne.
Template:	<b>j</b>			
HERO ID:	7924812			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		17068-78-9; Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Results Value		1 value reported in Reaxys - Crystal sys	stem: rhombic	
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	itv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain J. Oulor	Metric 5.	Databases	High	The information or data is from a recognized data collection/repository where data are
	Wette 5.	Databases	Ingn	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination				
	J Determin		Ingn	

\* Related References: Gmelin Handbuch der Anorganischen Chemie; vol. Al: MVol.A1; 23, page 65 - 67Warren, B. E.; Modell, D. I., Zeitschrift fur Kristallographie und Mineralogie, 1930, vol. 75, p. 161 - 161

Study Citation: OECD Harmonized	Elsevier, (2021) Physical Form o	. Reaxys: physical-chemical property d	ata for Tremolite.				
HERO ID:	7924814						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material	~	14567-73-8; Tremolite					
Confidentiality, Type, and C	Juideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR					
Results Value		I values reported in Reaxys - Crystal pl	hase: fibers. Collecto	ed using the search term 'tremolite' in Reaxys.			
Results Details		Not Reported					
			EVALUATIO	Ν			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	ity						
2011111211000	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other							
Domain 3. Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	ty Determi	nation	High				

\* Related References: Bhattacherjee, S.; Paul, A.; Journal of Materials Science; ; vol. 27; (1992); p. 704 - 710

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

Study Citation:	Elsevier, (2021)	. Reaxys: physical-chemical property d	ata for Tremolite.		
OECD Harmonized	Physical Form of	or State			
Template:					
HERO ID:	7924814				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		14567-73-8; Tremolite			
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR			
Results Value		1 values reported in Reaxys - Crystal sy	ystem: Monoclinic.	Collected using the search term 'tremolite' in Reaxys.	
Results Details		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Tast Paliabil					
Domain 2. Test Kenadin	Metric 3:	Paliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	Wieure 5.	(Method Objectivity)	wiedium	towards a particular product or outcome	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
				C I I I I I I I I I I I I I I I I I I I	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are	
				peer-reviewed by experts in the field, are broadly available to the public for review and	
			37/4	use OR includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualif	Averall Auglity Determination High				
	y Deter III		Ingn		

\* Related References: Bhattacherjee, S.; Paul, A.; Journal of Materials Science; ; vol. 27; (1992); p. 704 - 710

Study Citation: OECD Harmonized	Elsevier, (2021) Physical Form of	). Reaxys: physical-chemical property da or State	ta for Actinolite.	
Template: HERO ID:	7924815			
			EXTRACTIO	N
Parameter		Data		
CASPN and Test Material		12172 67 7: Actinolite		
Confidentiality Type and (	Guideline	None: Experimental: Not Reported		
Solvent Reactivity Storage	and Stability	NR·NR·NR		
Radiolabel Source State a	and Purity	NR: NR: Solid: NR		
Results Value	and Fully	1 value reported in Reaxys - Crystal syst	tem: monoclinic	
Results Details		Collected using the search term 'actinoli	ite' in Reaxys.	
		C	2	
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
2 011111 21 1000 10011001	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Other				
Domain 5: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	High	

\* Related References: Gmelin Handbuch der Anorganischen Chemie; vol. Al: MVol.A1; 23, page 65 - 67

Study Citation: OECD Harmonized	NLM, (2021). P Physical Form o	ubChem: Hazardous Substance Data Bar r State	nk: Chrysotile, 1	2001-29-5.
HERO ID:	7924733			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material	~	12001-29-5; Chrysotile		
Confidentiality, Type, and C	Juideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Results Value		Not Reported	iomomote)	
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
		(Method Objectivity)		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain 5. Other	Metric 5	Databases	High	Data is from a publicly available and peer-reviewed database
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
				e e e e e e e e e e e e e e e e e e e
Overall Qualit	ty Determi	nation	High	

\* Related References: Virta R; Asbestos. Kirk-Othmer Encyclopedia of Chemical Technology. (1999-2018). New York, NY: John Wiley & Sons. Online Posting Date: 15 Jul 2011

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 2 of 2

Study Citation: OECD Harmonized	NLM, (2021). P Physical Form o	ubChem: Hazardous Substance Data Ba r State	nk: Chrysotile, 1	2001-29-5.				
Template:	-							
HERO ID:	7924733							
			EXTRACTIO	N				
Parameter		Data						
CASRN and Test Material		12001-29-5; Chrysotile						
Confidentiality, Type, and Guideline		None; Experimental; Not Reported	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR						
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR						
Results Value		Curled sheet silicate, helix spiralled arou	ind a capillary. Fibi	ous with trioctahedral clay structure.				
Results Details		Not Reported						
			EVALUATIO	N				
Domain		Metric	Rating	Comments				
Domain 1: Substance								
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.				
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.				
Domain 2: Test Reliabil	ity							
20114111 21 1000 10014014014	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.				
		(Method Objectivity)						
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.				
Domain 3: Other	Matria 5.	Datahasas	Iliah	Dete is former weblight and have an investigated determined				
	Matria 6	Databases	High	Data is from a publicly available and peer-reviewed database.				
	Metric 0:	WIOUEIS	IN/A	kaung of unis factor is not applicable to this kind of information.				
<b>Overall Qualit</b>	Overall Quality Determination High							

\* Related References: IARC. Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans. Geneva: World Health Organization, International Agency for Research on Cancer, 1972-PRESENT. (Multivolume work). p. V14: 12 (1977)

Study Citation: OECD Harmonized Template:	Badollet, M. S. Physical Form o	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State		
HERO ID:	3827307			
		EXTRACTION		
Parameter		Data		
CASRN and Test Material	1	12001-29-5; Chrysotile		
Confidentiality, Type, and	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR		
Radiolabel, Source, State, and Purity		NR; NR; NR		
Results Details		Resistance to acids: weak, undergoes fairly rapid attack; Resistance to bases: very good; wt. % loss after 2 hr reflux with 25% acid or base: 55.69% (HCl), 23.42% (CH3COOH), 55.18% (H3PO4), 55.75% (H2SO4), 0.99% (NaOH); wt. % loss after 528 hr 26 deg C exposure to 25% acid or base: 56.00% (HCl), 24.02% (CH3COOH), 56.45% (H3PO4), 56.00% (H2SO4), 1.03% (NaOH)		

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliab	oility			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	N	(Method Objectivity)	<b>NT/A</b>	towards a particular product of outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.Physical Form or State			ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template:	3827307			
	5627507			
Doromotor		Data	EXTRACTIO	N
		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Flexibility: fair to good		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain 5. Oulei	Metric 5	Databases	N/A	Pating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information
	Method.	MOUCIS	11/71	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	High	

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3827307 Table: 3 of 30

Study Citation: OECD Harmonized	Badollet, M. S. ( Physical Form o	(1951). Asbestos, a mineral of unparal r State	leled properties. Tr	ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Flexibility: good		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	High	

Study Citation:	Badollet, M. S. (	(1951). Asbestos, a mineral of unparalle	led properties. Tr	ansactions. Canadian Institute of Mining and Metallurgy 54:151-160.
OECD Harmonized	Physical Form of	r State	ieu properties. II	and choice, canadian montate of mining and metanangy 5 mis 1 100.
Template:				
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Details		Resistance to acids: fair; Resistance to b (H3PO4), 3.69% (H2SO4), 1.35% (NaC 3.91% (H3PO4), 3.48% (H2SO4), 1.20%	ases: good; wt. % l DH); wt. % loss afte % (NaOH)	oss after 2 hr reflux with 25% acid or base: 4.38% (HCl), 0.91% (CH3COOH), 4.37% er 528 hr 26 deg C exposure to 25% acid or base: 3.14% (HCl), 1.02% (CH3COOH),
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
2 0000000000000000000000000000000000000	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Demein 2. Other				
Domain 3: Other	Matria 5.	Detaharaa	NT/A	
	Metric 5: Matria 6:	Databases	N/A N/A	Rating of this factor is not applicable to this kind of information.
	wieure 0.	widdels	IN/A	Rating of unis factor is not applicable to unis kind of information.
<b>Overall Qualit</b>	ty Determi	nation	High	

Study Citation: OECD Harmonized	<ul> <li>Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.</li> <li>Physical Form or State</li> </ul>				
HERO ID:	3827307				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12172-73-5; Amosite			
Confidentiality, Type, and C		None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR ND: ND: ND			
Results Details	Source, State, and Purity NR; NR; NR iils Resistance to acids: fair, slowly attacked; Resistance to bases: good; wt. % loss after 2 hr reflux with 25% acid or base: 12.84% (HCl), 2.0 (CH3COOH), 11.67% (H3PO4), 11.35% (H2SO4), 6.97% (NaOH); wt. % loss after 528 hr 26 deg C exposure to 25% acid or base: 12.00% (H 3.08% (CH3COOH), 11.83% (H3PO4), 11.71% (H2SO4), 6.82% (NaOH)				
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	ity				
Domain 2. Test Rendom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other	Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	y Determi	nation	High		

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State			ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
	5627567		EVTDACTIO	
Parameter		Data	LATRACTIO	
CASRN and Test Material		77536-68-6; Tremolite		
Confidentiality, Type, and C	Juideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NK; NK; NK; NK	0	
Results Details		Texture: generally harsh, sometimes so	It	
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3 <sup>,</sup> Other				
Domain 5. Outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determi	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. Physical Form o	ollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. ical Form or State				
Template: HERO ID:	3827307					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		77536-68-6: Tremolite				
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR				
Results Details		Color: Gray-white, greenish, yellowish	, blueish			
р .			EVALUATION	N		
Domain		Metric	Rating	Comments		
Domain I: Substance	N . · 1		TT' 1			
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	IN/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	y Determi	nation	High			

Study Citation: OECD Harmonized	Badollet, M. S. ( Physical Form or	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State					
HERO ID:	3827307						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		77536-67-5; Anthophyllite					
Confidentiality, Type, and C	Buideline	None; Experimental; Not reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR					
Results Details		Color: Grayish white, brown-gray or g	reen				
			EVALUATION	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2. Test Reliabili	tv						
Bomum 2. Test Kendom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)	1110010111	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other	N		<b>NT/A</b>				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	y Determin	ation	High				

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 3827307 Table: 9 of 30

Study Citation: OECD Harmonized	Badollet, M. S. Physical Form c	(1951). Asbestos, a mineral of unparal or State	leled properties. Tr	ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
			FYTRACTIO	N
Parameter		Data	EATRACTIO	1
CASRN and Test Material		77536-66-4; Actinolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Color: Greenish		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. Physical Form o	(1951). Asbestos, a mineral of unparall r State	leled properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-67-5: Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Details		Texture: harsh		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State						
HERO ID:	3827307						
EXTRACTION							
Parameter		Data					
CASDN and Track Material		77526 66 A. A. Harris 1142					
CASRN and Test Material		//536-66-4; Actinolite					
Solvent Depetivity Storage and Stability		ND, ND, ND, ND					
Radiolabel Source State and Purity		NR · NR · NR · NR					
Results Details		Texture: harsh					
EVALUATION							
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliability							
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other							
Domain 5. Oulor	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Qualit	y Determi	nation	High				

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State						
Template: HERO ID:	3827307						
ΕΥΤΡΑCΤΙΩΝ							
Parameter		Data	EATRACTIO				
CASRN and Test Material		77536-68-6; Tremolite					
Confidentiality, Type, and Guideline		None; Experimental; Not reported					
Solvent, Reactivity, Storage, and Stability		NR; NR; NR; NR					
Radiolabel, Source, State, and Purity		NR; NR; NR; NR					
Results Details Spinnability: generally poor, some are spin		spinnable					
Demein		Matria	EVALUATIO	N Commente			
Domain Domain 1, Substance		Metric	Rating	Comments			
Domain 1: Substance	Matria 1.	Depresentativaness	High	Data are measured for the subject chemical substance			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information			
		rippiopilateness	1.071	Runng of this factor is not apprecisite to this kind of information.			
Domain 2: Test Reliability							
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Quality Determination</b>							
Study Citation: OECD Harmonized	Badollet, M. S. ( Physical Form o	(1951). Asbestos, a mineral of unparal r State	leled properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.			
------------------------------------	--------------------------------------	--	----------------------	---			
HERO ID:	3827307						
			EXTRACTIO	N			
Parameter		Data					
CASRN and Test Material		7/536-67-5; Anthophyllite					
Confidentiality, Type, and C		None; Experimental; Not reported					
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR					
Results Details		Spinnability: poor					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabili	itv						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	y Determin	nation	High				

Study Citation: OECD Harmonized	<ul> <li>Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.</li> <li>Physical Form or State</li> </ul>			ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-66-4: Actinolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Spinnability: poor		
			EVALUATIO	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	High	

Study Citation: OECD Harmonized	Study Citation:Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160OECD HarmonizedPhysical Form or State			ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-68-6; Tremolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Flexibility: generally brittle, sometime	es flexible	
Domain		Matria	EVALUATION	Comments
Domain 1: Substance		Metric	Katilig	Comments
Domain 1. Substance	Metric 1	Representativeness	High	Data are measured for the subject chemical substance
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Paliabili	tv.			
Domain 2. Test Kenaoni	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State			ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		7/536-67-5; Anthophyllite		
Confidentiality, Type, and C		None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Flexibility: very brittle, non-flexible		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2 <sup>.</sup> Test Reliabili	tv			
2 chain 2. Tost Rendom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	N	(Method Objectivity)	NT/ A	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determir	nation	High	

Study Citation: OECD Harmonized	<b>n:</b> Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. <b>nized</b> Physical Form or State			ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASDN and Test Material		77526 66 A. Astinalita		
CASKIN and Test Material	Juidalina	None: Experimental: Not reported		
Solvent Reactivity Storage	and Stability	NR NR NR NR		
Radiolabel, Source, State, a	nd Purity	NR: NR: NR: NR		
Results Details		Flexibility: brittle and non-flexible		
		-		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	tv			
2	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	Matria 5.	Databasas	NT/A	Define of this forten is not confirmed to this land of information
	Metric 5:	Databases Models	IN/A N/A	Rating of this factor is not applicable to this kind of information.
	wieuric o:	WIOUEIS	IN/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determir	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State			
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material	Juideline	77536-68-6; Tremolite		
Solvent, Reactivity, Storage Radiolabel, Source, State, a	e, and Stability and Purity	NR; NR; NR; NR NR; NR; NR; NR		
Results Details	sults DetailsResistance to acids: fair; Resistance to bases: good; wt. % loss after 2 hr reflux with 25% acid or base: 4.77% (HCl), 1.99% (CH3COO (H3PO4), 4.58% (H2SO4), 1.80% (NaOH); wt. % loss after 528 hr 26 deg C exposure to 25% acid or base: 4.22% (HCl), 1.41% (CH 4.89% (H3PO4), 4.74% (H2SO4), 1.65% (NaOH)			oss after 2 hr reflux with 25% acid or base: 4.77% (HCl), 1.99% (CH3COOH), 4.99% er 528 hr 26 deg C exposure to 25% acid or base: 4.22% (HCl), 1.41% (CH3COOH),
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance			TT' 1	
	Metric 1: Matria 2:	Appropriateness	High N/A	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	IN/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	nation	High	

Study Citation: OECD Harmonized	<ul> <li>Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.</li> <li>Physical Form or State</li> </ul>			
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-67-5; Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Details	Resistance to acids: fair; Resistance to bases: very good; wt. % loss after 2 hr reflux with 25% acid or base: 2.66% (HCl), 0.60% (CH 3.16% (H3PO4), 2.73% (H2SO4), 1.22% (NaOH); wt. % loss after 528 hr 26 deg C exposure to 25% acid or base: 2.13% (HC (CH3COOH), 3.29% (H3PO4), 2.90% (H2SO4), 1.77% (NaOH)			rt. % loss after 2 hr reflux with 25% acid or base: 2.66% (HCl), 0.60% (CH3COOH), % loss after 528 hr 26 deg C exposure to 25% acid or base: 2.13% (HCl), 1.04% aOH)
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Other				
Domain J. Oulo	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	Overall Quality Determination High			

Study Citation: OECD Harmonized	<ul> <li>Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.</li> <li>Physical Form or State</li> </ul>			
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-66-4: Actinolite		
Confidentiality, Type, and C	Guideline	None: Experimental: Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details	Resistance to acids: fair; Resistance to bases: fair; wt. % loss after 2 hr reflux with 25% acid or base: 20.31% (HCl), 12.28% (CI 20.19% (H3PO4), 20.38% (H2SO4), 9.25% (NaOH); wt. % loss after 528 hr 26 deg C exposure to 25% acid or base: 22.55% (HC (CH3COOH), 20.10% (H3PO4), 20.60% (H2SO4), 9.43% (NaOH)			loss after 2 hr reflux with 25% acid or base: 20.31% (HCl), 12.28% (CH3COOH), % loss after 528 hr 26 deg C exposure to 25% acid or base: 22.55% (HCl), 12.14% (NaOH)
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain J. Outer	Metric 5	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	Overall Quality Determination High			

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State			ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
			EXTRACTIO	Ň
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Buideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Color: White, gray, green, yellowish		
				N
Domain		Metric	Rating	Comments
Domain 1: Substance		incure	Ituting	Connicity
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	tv			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determir	nation	High	

Study Citation: OECD Harmonized	<ul> <li>Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.</li> <li>d Physical Form or State</li> </ul>			ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template:	2027207			
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Color: Ash gray, greenish, or brown		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity	5		
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Matria 4.	(Method Objectivity) Reliability/Analytical Method	NT/A	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	IN/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	v Determir	nation	High	
	y Determin		Ingn	

Study Citation: OECD Harmonized	Badollet, M. S. ( Physical Form or	1951). Asbestos, a mineral of unparal State	leled properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASEN and Test Material		12001 28 4: Crasidalita		
Confidentiality Type and (	Juideline	None: Experimental: Not reported		
Solvent Reactivity Storage	and Stability	NR: NR: NR: NR		
Radiolabel, Source, State, a	nd Purity	NR: NR: NR: NR		
Results Details		Color: Lavender, blue, greenish		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	tv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determin	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State			ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
	3027307		EVTRACTIO	 N
Parameter		Data	EATRACTIO	
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Texture: silky, soft to harsh		
			EVALUATIO	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ty			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determir	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. ( Physical Form of	1951). Asbestos, a mineral of unparallel r State	led properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		·
CASRN and Test Material		12172-73-5: Amosite		
Confidentiality, Type, and C	Juideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Texture: coarse, but somewhat pliable		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ty			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determir	nation	High	

Study Citation: OECD Harmonized	<ul> <li>Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.</li> <li>Physical Form or State</li> </ul>			ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
	3027307		EVTRACTIO	N
Parameter		Data	EATRACTIO	
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	Buideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Texture: soft to harsh		
			EVALUATIO	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ty			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determir	nation	High	

Study Citation: OECD Harmonized	<ul><li>Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.</li><li>d Physical Form or State</li></ul>			ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	
Parameter		Data		
CASEN and Test Material		12172 72 5: Amosita		
Confidentiality Type and C	Juideline	None: Experimental: Not reported		
Solvent Reactivity Storage	and Stability	NR: NR: NR NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details	5	Spinnability: fair		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Physical Form or State			ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Spinnability: very good		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. ( Physical Form of	1951). Asbestos, a mineral of unparal r State	leled properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-28-4: Crocidolite		
Confidentiality. Type, and C	luideline	None: Experimental: Not reported		
Solvent, Reactivity, Storage	, and Stability	NR: NR: NR: NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Spinnability: fair		
				۲.
Domain		Matria	EVALUATION	Comments
Domain 1: Substance		Wiettie	Kating	Comments
Domain 1. Substance	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	tv			
Domain 2. Test Reliabili	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determir	nation	High	

Study Citation: OECD Harmonized	n:Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.onizedPhysical Form or State			ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details		Flexibility: high		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	High	

Study Citation: OECD Harmonized	Elsevier, (2021). Physical Form or	Reaxys: physical-chemical property da	ta for Chrysotile.	
Template: HERO ID:	7924810			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR		
Results Details		6 values were reported in Reaxys - Colo	r: Green (1), white	(3), yellowish green (1), yellowish white (1).
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance		- ·		
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	36.5.5			
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determir	ation	High	

\* Related References: Devečerski et al.; Journal of Alloys and Compounds; vol. 464; nb. 1-2; (2008); p. 270 – 276; Zhu et al.; Inorganic Chemistry; vol. 51; nb. 11; (2012); p. 6020 – 6031; Hall, A. L.; South Africa geol. Surv. Mem. Nr. 12 {1930} 28

Study Citation: OECD Harmonized	Elsevier, (2021). Physical Form o	Reaxys: physical-chemical property days and the second sec	ata for Anthophyll	lite.
Template: HERO ID:	7924812			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		17068-78-9; Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR		
Results Details		3 values reported in Reaxys - Color: Li	ght brown, pale gree	n, and white.
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	34.1.1			
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
2 0000000	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	36.5.5	D . 1		
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determin	nation	High	

\* Related References: Gmelin Handbuch der Anorganischen Chemie; vol. Al: MVol.A1; 23, page 65 – 67; Walitzi, E. M.; Walter, F.; Ettinger, K.; Zeitschrift fur Kristallographie; ; vol. 188; (1989); p. 237 - 244

Study Citation: OECD Harmonized	Larrañaga, M. D Physical Form c	D., Lewis, R. J., Lewis, R. A. (2016). Ha or State	awley's condensed	chemical dictionary. :57, 58, 1232.	
Template: HERO ID:	5333260				
			EXTRACTIO	Ň	
Parameter		Data			
CASRN and Test Material		1332-21-4; Asbestos			
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR			
Results Details		Color: White, gray, green, or brown.			
	EVALUATION				
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	itv				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other	Matria 5.	Detaharan	11:-1		
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	y Determi	nation	High		

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 5333260 Table: 2 of 8

Study Citation:	Larrañaga, M. I	D., Lewis, R. J., Lewis, R. A. (2016). H	awley's condensed	chemical dictionary. :57, 58, 1232.		
OECD Harmonized	Physical Form of	or State				
Template:						
HERO ID:	5333260					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material		1332-21-4; Asbestos				
Confidentiality, Type, and	Guideline	None; Experimental; Not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR				
Results Details		Spinnability: Possible with longer fiber	rs (serpentine asbesto	os); brittle and cannot be spun (amphibole asbestos)		
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2. Test Deliabil	:+					
Domain 2: Test Kenabii	Illy Matria 2:	Paliability/Unbiased	Madium	There is no indication that the methodology for moduling the information was biased		
	Metric 5.	(Method Objectivity)	Wiedrum	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are		
				peer-reviewed by experts in the field, are broadly available to the public for review and		
	Metric 6	Models	N/A	Bating of this factor is not applicable to this kind of information		
	menie 0.	1104013	11/11	Name of this factor is not applicable to this kind of information.		
<b>Overall Ouali</b>	Overall Quality Determination High					
	- <u>j</u> <u></u>		8			

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 5333260 Table: 3 of 8

Study Citation:	Larrañaga, M. I	D., Lewis, R. J., Lewis, R. A. (2016). H	awley's condensed	chemical dictionary. :57, 58, 1232.		
OECD Harmonized	Physical Form of	or State				
Template:						
HERO ID:	5333260					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material		1332-21-4; Asbestos				
Confidentiality, Type, and	Guideline	None; Experimental; Not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR				
Results Details		Composition: magnesium silicate (serg	pentine); magnesium,	iron, calcium, and sodium silicates (amphibole)		
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2. Test Deliabil	:+					
Domain 2: Test Kenabii	Illy Matria 2:	Paliability/Unbiased	Madium	These is no indication that the methodology for mechanics the information was biased		
	Metric 5.	(Method Objectivity)	Wiedrum	towards a particular product or outcome		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are		
				peer-reviewed by experts in the field, are broadly available to the public for review and		
	Metric 6	Models	N/A	Bating of this factor is not applicable to this kind of information		
	menie 0.	1104013	11/11	Ranne of and factor is not appreable to any kind of information.		
<b>Overall Ouali</b>	Overall Quality Determination High					
	- <u>j</u> <u></u>		8			

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 5333260 Table: 4 of 8

Study Citation:	Larrañaga, M. D	., Lewis, R. J., Lewis, R. A. (2016). Ha	wley's condensed	chemical dictionary. :57, 58, 1232.		
OECD Harmonized	Physical Form o	r State				
Template:						
HERO ID:	5333260					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material		77536-67-5; Anthophyllite				
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR				
Results Details		Composition: magnesium and iron silic	ates.			
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	itv					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other	M ( <sup>1</sup> 5		TT' 1			
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	y Determi	nation	High			

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 5333260 Table: 5 of 8

Study Citation:	Larrañaga, M. D	D., Lewis, R. J., Lewis, R. A. (2016). H	awley's condensed	chemical dictionary. :57, 58, 1232.
Template.	T flystear Form o	1 State		
HERO ID:	5333260			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-68-6; Tremolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR		
Results Details		Mohs hardness: 5 to 6		
			EVALUATIO	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity.			
Domain 2. Test Kendon	Motric 3:	Paliability/Unbiased	Madium	There is no indication that the methodology for producing the information was biased
	Metric 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Other				
Domain 5: Other	Matria 5:	Databasas	Uiah	The information of date is from a macconized date collection (non-exitent where date are
	Metric 5.	Databases	nigii	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determi	nation	High	

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 5333260 Table: 6 of 8

Study Citation:	Larrañaga, M. D	D., Lewis, R. J., Lewis, R. A. (2016). H	awley's condensed	chemical dictionary. :57, 58, 1232.
Tomplete:	Filysical Follil 0	1 State		
HERO ID:	5333260			
			EVTRACTIO	
Parameter		Data	EATRACIIO	IN
		Data		
CASRN and Test Material		77536-68-6: Tremolite		
Confidentiality Type and (	Guideline	None: Experimental: Not reported		
Solvent Reactivity Storage	and Stability	NR · NR · NR		
Radiolabel Source State	and Purity	NR: NR: Solid: NR		
Results Details	ind I drity	Color: white to light-green		
Results Details		color. while to light green		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
Domain 2. Test Kenabi	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Wieute 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	nation	High	

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 5333260 Table: 7 of 8

Study Citation:	Larrañaga, M. I	D., Lewis, R. J., Lewis, R. A. (2016). H	awley's condensed	chemical dictionary. :57, 58, 1232.
Tomplato:	i nysicai roini c	5 State		
HERO ID:	5333260			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-68-6; Tremolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	und Purity	NR; NR; Solid; NR		
Results Details		Luster: vitreous to silky		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
2011411 21 1000 1001401401	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	medie 5.	(Method Objectivity)	meanum	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3. Other				
20main 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	High	

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 5333260 Table: 8 of 8

Study Citation:	Larrañaga M I	$\mathbf{P}$ Lewis <b>R</b> L Lewis <b>R</b> A (2016) H	awley's condensed	chemical dictionary :57 58 1232
OECD Harmonized	Physical Form of	or State	awiey s condensed	chemical dictionary57, 56, 1252.
Template:	<u>,</u>			
HERO ID:	5333260			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-66-4; Actinolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Results Details		Color: greenish		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Test Reliabil	itv			
Domain 2. Test Renabil	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain 5. Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
				peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Oualit</b>	v Determi	nation	High	
	· · · · · · · · · · · · · · · · · · ·		8	

Study Citation:	NLM. (2021). 1	PubChem: Hazardous Substance Data Ba	nk: Chrysotile, 1	2001-29-5				
OECD Harmonized	Physical Form	Physical Form or State						
Template:								
HERO ID:	7924733							
			EXTRACTIO	N				
Parameter		Data						
CASRN and Test Material		12001-29-5: Chrysotile						
Confidentiality, Type, and	Guideline	None: Experimental: Not reported						
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR						
Radiolabel, Source, State,	and Purity	NR; NR; Solid; NR						
Results Details	·	Color: usually white to grayish green, m	ay have tan colorin	g				
			EVALUATIO	N				
Domain		Metric	Rating	Comments				
Domain 1: Substance								
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.				
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.				
Domain 2: Test Reliabi	lity							
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.				
		(Method Objectivity)						
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.				
Domain 3: Other								
	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.				
		Models	N/A	Rating of this factor is not applicable to this kind of information				

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 2 of 11

Study Citation: OECD Harmonized	NLM, (2021). P Physical Form c	PubChem: Hazardous Substance Data Ba or State	ank: Chrysotile, 1	2001-29-5.	
HERO ID:	7924733				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and	Guideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR			
Results Details		Unit fiber average diameter: 0.025 µm.	Fiber aggregate dia	meters: 0.1 - 100 um. Length: fraction of a millimeter - several centimeters, but most	
		< 1 cm			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.	
		(Method Objectivity)			
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Quality Determination High				

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 3 of 11

Study Citation: OECD Harmonized	NLM, (2021). Pu Physical Form or	IbChem: Hazardous Substance Data I	Bank: Chrysotile, 1	2001-29-5.
Template:	1 119 510 11 1 01111 01			
HERO ID:	7924733			
			EXTRACTIO	Ň
Parameter		Data		
		12001 20 5 61		
CASRN and Test Material	Tuidalina	12001-29-5; Chrysotile		
Confidentiality, Type, and C	Juideline	None; Experimental; Not reported		
Badialabal Source State	, and Stability	NR; NR; NR; NR ND: ND: Solid: ND		
Results Details	ind I unity	Composition: Silica sheet (Si2O5), wi	ith a layer of brucite (	Mg(OH)2) with every 3 hydroxyls replaced by oxygens
Results Details		Composition. Since sheet (Si2OS), wh	ful a layer of bruche (	vig(011/2) with every 5 hydroxyts replaced by oxygens.
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	itv			
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
		(Method Objectivity)		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
		- <b>4</b>	II:~h	
Overall Qualit	y Determin		High	

\* Related References: Kirk-Othmer Encyclopedia of Chemical Technology. 3rd ed., Volumes 1-26. New York, NY: John Wiley and Sons, 1978-1984., p. V3: 269 (1978)

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 4 of 11

Study Citation: OECD Harmonized	NLM, (2021). Pu Physical Form or	bChem: Hazardous Substance Data Ban State	k: Chrysotile, 1	2001-29-5.	
Template: HERO ID:	7924733				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR			
Results Details		Individual fiber diameter: 0.02 - 0.03 µm			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other	Domain 3: Other				
	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	y Determin	ation	High		

\* Related References: Kirk-Othmer Encyclopedia of Chemical Technology. 3rd ed., Volumes 1-26. New York, NY: John Wiley and Sons, 1978-1984., p. V3: 269 (1978)

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 5 of 11

Study Citation: OECD Harmonized	NLM, (2021). Pu Physical Form or	bChem: Hazardous Substance Data Ba State	ank: Chrysotile, 1	2001-29-5.		
Template: HERO ID:	7924733					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR				
Results Details		Average fiber outer diameter: 200 A				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.		
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
Domain 5. Outer	Metric 5	Databases	High	Data is from a publicly available and neer-reviewed database		
	Metric 6	Models	N/A	Rating of this factor is not applicable to this kind of information		
	metrie 0.	mouth	1 1/2 1	Taking of and factor is not appreade to and kind of information.		
<b>Overall Qualit</b>	y Determin	ation	High			

\* Related References: National Research Council. Drinking Water & Health Volume 1. Washington, DC: National Academy Press, 1977., p. 150

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 6 of 11

Study Citation: OECD Harmonized	NLM, (2021). Pt Physical Form or	ıbChem: Hazardous Substance Data E · State	Bank: Chrysotile, 1	2001-29-5.	
Template: HERO ID:	7924733				
			EXTRACTIO	N	
Parameter		Data			
CASEN and Test Material		12001 20 5: Chrysotile			
Confidentiality Type and C	Juideline	None: Experimental: Not reported			
Solvent Reactivity Storage	and Stability	NR· NR· NR· NR			
Radiolabel, Source, State, a	nd Purity	NR: NR: Solid: NR			
Results Details		Luster: silky			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other	Domain 3: Other				
	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	y Determin	nation	High		

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 7 of 11

Study Citation: OECD Harmonized	NLM, (2021). Pu Physical Form or	bChem: Hazardous Substance Data B State	ank: Chrysotile, 1	2001-29-5.	
Template: HERO ID:	7924733				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR			
Results Details		Hardness (Mohs): 2.5 - 4.0			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other	Domain 3: Other				
	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	y Determin	ation	High		

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 8 of 11

Study Citation:	NLM, (2021). Pu	bChem: Hazardous Substance Data B	ank: Chrysotile, 12	2001-29-5.
Template.	r nysicai ronn oi	State		
HERO ID:	7924733			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR		
Results Details		Optical properties: biaxial positive par	allel extinction	
			EVALUATION	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
		(Method Objectivity)		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	ation	High	
## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 9 of 11

Study Citation: OECD Harmonized	NLM, (2021). Pu Physical Form of	ubChem: Hazardous Substance Data E r State	Bank: Chrysotile, 1	2001-29-5.
Template: HERO ID:	7924733			
			EXTRACTIO	N
Parameter		Data		
		10001-00-5-61		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C		None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NK; NK; NK; NK		
Radioladel, Source, State, a	ind Purity	INK, INK, SOIIU, INK Elovibility: high		
Results Details		Flexibility. liigh		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3 <sup>.</sup> Other				
2 stanin 5. outer	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>				

\* Related References: Virta R; Asbestos. Kirk-Othmer Encyclopedia of Chemical Technology. (1999-2018). New York, NY: John Wiley & Sons. Online Posting Date: 15 Jul 2011

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 10 of 11

Study Citation: OECD Harmonized	NLM, (2021). Pu Physical Form or	bChem: Hazardous Substance Data B State	ank: Chrysotile, 1	2001-29-5.
HERO ID:	7924733			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Buideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR		
Results Details		Texture: silky, soft to harsh		
				·
			EVALUATION	N
Domain		Metric	Rating	Comments
Domain I: Substance	34.1.1	<b>D</b>		
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ty			
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination			High	

\* Related References: Virta R; Asbestos. Kirk-Othmer Encyclopedia of Chemical Technology. (1999-2018). New York, NY: John Wiley & Sons. Online Posting Date: 15 Jul 2011

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Physical Form or State

HERO ID: 7924733 Table: 11 of 11

Study Citation: OECD Harmonized	NLM, (2021). Pu Physical Form or	bChem: Hazardous Substance Data B State	ank: Chrysotile, 1	2001-29-5.
HERO ID:	7924733			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR		
Results Details		Tensile strength: 1100 - 4400 Mpa		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain 5. Outer	Metric 5	Databases	High	Data is from a publicly available and peer-reviewed database
	Metric 6	Models	N/A	Rating of this factor is not applicable to this kind of information
	incure 0.	mouth	10/11	Adding of this factor is not apprecisit to this kind of information.
<b>Overall Qualit</b>	y Determin	ation	High	

\* Related References: Virta R; Asbestos. Kirk-Othmer Encyclopedia of Chemical Technology. (1999-2018). New York, NY: John Wiley & Sons. Online Posting Date: 15 Jul 2011

00(1):00-08.			Sucik, G., Szaboova, A., Popovic, L., Hrsak, D. (2016). The relationship between thermal treatment of serpentine and its reactivity. Materiali in Tehnologije				
Physical Form or State							
<b>J</b>							
3581598							
		EXTRACTION					
	Data						
	12001-29-5; Chrysotile						
deline	None; Experimental; Not reported						
nd Stability	NR; NR; NR; NR						
Purity	NR; NR; NR; NR						
	Surface area: 16.2 m <sup>2</sup> /g at 600°C to 45	5.2 m <sup>2</sup> /g at 700°C and ba	ick down to $2 \text{ m}^2/\text{g}$ at $1100^{\circ}\text{C}$ calcination temperature.				
		EVALUATION					
	Metric	Rating	Comments				
Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.				
Metric 2:	Appropriateness	Medium	Data measured for a structural analogue of the subject chemical substance are consistent with what is expected for the subject chemical substance structural properties, features or behaviors.				
Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.				
Metric 4:	Reliability/Analytical Method	Medium	Analytic method is non-standard but is expected to be appropriate.				
Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.				
Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.				
	deline nd Stability Purity Metric 1: Metric 2: Metric 3: Metric 4: Metric 5: Metric 6:	J3581598         Data         12001-29-5; Chrysotile         deline       None; Experimental; Not reported         nd Stability       NR; NR; NR; NR         Purity       NR; NR; NR; NR         Surface area: 16.2 m^2/g at 600°C to 45         Metric         Metric 1:         Metric 2:         Appropriateness         Metric 4:         Reliability/Unbiased (Method Objectivity)         Metric 4:         Metric 5:         Databases         Metric 6:	EXTRACTION         Data         EXTRACTION         Data         12001-29-5; Chrysotile         deline         None; Experimental; Not reported         nd Stability       NR; NR; NR         Purity       NR; NR; NR; NR         Purity       NR; NR; NR; NR         Surface area:       16.2 m^2/g at 600°C to 45.2 m^2/g at 700°C and ba         EVALUATION         Metric       1:         Metric       Representativeness         High       Metric 2:         Appropriateness       High         Metric 3:       Reliability/Unbiased       High         Metric 4:       Reliability/Analytical Method       Medium         Metric 5:       Databases       N/A         Metric 6:       Models       N/A				

HERO ID: 786664 Table: 1 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). ' Melting Point	Toxicological profile for asbestos (Up	odate, September 2	001).
Template:	C			
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Melting Point		600 - 900 °C		
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods		not specified		
Standard Deviation Results		not specified		
Results Details		not specified		
				<b>A</b> Y
Damain		Matria	EVALUATIO	N Commente
Domain Demain 1: Substance		Metric	Kaung	Comments
Domain 1: Substance	Matria 1.	Bannagantativanaga	High	Determined an activity of far the archivet above induction
	Metric 1: Metric 2:	Appropriateness	підії Ціар	Data are measured or estimated for the subject chemical substance.
	Metric 2.	Appropriateness	nigii	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5. Other	Metric 5	Databases	High	The information or data is from a recognized data collection/repository where data are
	Wette 5.	Databases	Ingn	peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

HERO ID: 786664 Table: 2 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Melting Point	Toxicological profile for asbestos (Up	odate, September 20	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
		900 950 °C		
Melting Point CASPN and Test Material		800 - 850 °C 12001 29 5: chrysotile		
Confidentiality Type and (	Juideline	none: not specified: not specified		
Solvent, Reactivity, Storage	and Stability	NR: NR: NR: NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods	2	not specified		
Standard Deviation Results		not specified		
Results Details		not specified		
			EVALUATIO	
Domain		Metric	Rating	Comments
Domain 1: Substance			6	
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

HERO ID: 786664 Table: 3 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Melting Point	Toxicological profile for asbestos (Up	odate, September 2	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Melting Point		800 - °C		
CASKIN and Test Material	"wideline	12001-28-4; crocidolite		
Solvent Reactivity Storage	and Stability	NR · NR · NR · NR		
Radiolabel, Source, State, a	and Purity	NR: NR: NR: NR Notes: NR		
Results Details Methods		not specified		
Standard Deviation Results		not specified		
Results Details		not specified		
				A.
Domain		Matria	EVALUATIO	N Commonts
Domain 1: Substance		Metric	Katilig	Comments
Domain 1. Substance	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Tast Paliabili	4.7			
Domain 2. Test Kenaom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

HERO ID: 786664 Table: 4 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Melting Point	Toxicological profile for asbestos (Up	odate, September 2	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Melting Point		1040 - °C		
CASRN and Test Material	- Vidalina	1456/-/3-8; tremolite		
Solvent Reactivity Storage	and Stability	NR NR NR NR		
Radiolabel, Source, State, a	and Purity	NR: NR: NR: NR Notes: NR		
Results Details Methods		not specified		
Standard Deviation Results		not specified		
Results Details		not specified		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	M . 1		TT' 1	
	Metric 1: Metric 2:	Appropriateness	High High	Data are measured or estimated for the subject chemical substance.
	Metric 2.	Appropriateness	nigii	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Demain 2. Other				
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
	Metric 5.	Databases	nigii	peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

HERO ID: 786664 Table: 5 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Melting Point	Toxicological profile for asbestos (Up	odate, September 20	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Melting Point		950 - °C		
CASRN and Test Material		17068-78-9; anthophyllite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods		not specified		
Standard Deviation Results		not specified		
Results Details		not specified		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 3. Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>		High		

Study Citation:	California Office of Environmental Health Hazard Assessment (OEHHA) (2011). Appendix B: Chemical-specific summaries of the information used to				
<b>OECD Harmonized</b>	Melting Point	d cancer potency values.			
Template:	C				
HERO ID:	5155632				
			EXTRACTIO	N	
Parameter		Data			
Melting Point		600 °C			
CASRN and Test Material		1332-21-4; Asbestos			
Confidentiality, Type, and C		none; not specified; NR			
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR	(000 <b>G</b>		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: decomposes at t	500°C		
Results Details Methods		NR			
Standard Deviation Results		NK Not Deported			
Results Details		Not Reported			
			EVALUATION	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	Matria 4:	(Method Objectivity) Reliability/Analytical Method	Madium	The explicit method is unknown but is likely to be empropriete based on the deta's	
	Meuric 4.	Kenaointy/Anarytical Method	Wedium	inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 3 <sup>,</sup> Other					
Domain J. Outer	Metric 5	Databases	Medium	The data are from a source that is known but is missing elements required for High	
	Wette 5.	Databases	Wiedium	designation such as peer-review, public availability, or the inclusion of references to original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Ovorall Oualit	y Dotormin	ation	High		
Over all Qualit	y Deter initi	auvii			

\* Related References: Citing National Institute for Occupational Safety and Health (NIOSH) 1994, HERO ID 2328101.

HERO ID: 3981007 Table: 1 of 1

Study Citation:	Cameo Chemica	als, (2016). Chemical datasheet: asbest	cos.			
OECD Harmonized	Melting Point					
HERO ID:	3981007					
			EXTRACTIO	N		
Parameter		Data				
Melting Point		1112 F				
CASRN and Test Material		1332-21-4: Asbestos				
Confidentiality, Type, and Confidentiality, and Confident	Guideline	None: Experimental: Not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR				
Results Details Methods	•	NR				
Standard Deviation Results		NR				
Results Details		Decomposes				
			FVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance			Tuning			
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features		
				(e.g., presence of certain functional groups) or other physical/chemical properties or behaviors.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other						
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	Overall Quality Determination High					

\* Related References: NIOSH, 2016 cited but no other details available

HERO ID: 3981008 Table: 1 of 1

Study Citation: OECD Harmonized	Cameo Chemic Melting Point	als, (2016). Chemical datasheet: asbest	os (blue).	
HERO ID:	3981008			
			EXTRACTIO	N
Parameter		Data		
Melting Point		1112 - F		
CASRN and Test Material	- · · · ·	12001-28-4; Crocidolite		
Confidentiality, Type, and C		None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radioladel, Source, State, a	ind Purity	NK; NK; NK; NK NOIES: NK		
Standard Deviation Deculta		Not reported		
Standard Deviation Results		Decomposed		
Results Details		Decomposes		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
				(e.g., presence of certain functional groups) or other physical/chemical properties or behaviors.
Domain 2: Test Reliabil	itv			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
Domain 5. Ould	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	High	

\* Related References: NIOSH, 2016 cited but no other details available

Study Citation:	Candela, P. A., Crummett, C. D., Earnest, D. J., Frank, M. R., Wylie, A. G. (2007). Low-pressure decomposition of chrysotile as a function of time and					
OECD Harmonized	Melting Point	rican Mineralogist $92(10):1/04-1/13$ .				
Template: HERO ID:	3582618	3582618				
	EXTRACTION					
Parameter	Data					
Melting Point		Not Reported				
CASRN and Test Material	ial 12001-29-5; Chrysotile					
Confidentiality, Type, and G	Buideline	None; Experimental; NR				
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, as	nd Purity	NA; Thetford, Quebec, Canada; Jeffrey Mir NR; 96%; 96%; NR Notes: 4 different samp Performed in Lindherg box-type quench fur	ne, Asbestos, Qu bles used. nace	uebec, Canada; New Idria, California; Jeffrey Mine, Asbestos, Quebec, Canada; Solid;		
Standard Deviation Results		Not Reported	nace.			
Results Details		Destruction of chrysotile began at 400°C after at 600°C after 4 hours or at 500°C for 30 day	er 4 hours, with	recrystallization observed between 450 and 550°C. Complete destruction was observed truction was not observed after beating to $475^{\circ}$ C for 30 days. Above 800°C destruction		
		occurs within minutes.	s. complete des	authon was not observed after nearing to 475 C for 50 days. Above 600 C, destruction		
		ŀ	EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabili	ty					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	y Determina	ation	High			

Study Citation: OECD Harmonized	EC, (2012). Prac Melting Point	tical guidelines for the information and	d training of workers inv	olved with asbestos removal or maintenance work.
HERO ID:	3981018			
			EXTRACTION	
Parameter		Data		
		× 1000 °C		
Melting Point		> 1200 - °C		
CASRIN and Test Material	7	1552-21-4; aspestos		
Solvent Reactivity Storage	Juluellile	NOIE; experimental; Not reported		
Padiolabel Source State	and Durity	ND. ND. ND. ND Notes: ND		
Results Details Methods	and I unity	NR		
Standard Deviation Results		NR		
Results Details		Not Reported		
Results Details		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical's physical/chemical properties.
Domain 2. Test Reliabil	ity			
2 sinuin 2. Test Rendon	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	Medium	Data is from a publicly available secondary source.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	ation	Medium	

Study Citation: OECD Harmonized	ECHA, (2021). E Melting Point	CHA scientific report for evaluation of	limit values for a	asbestos at the workplace.	
HERO ID:	9109807				
			EXTRACTIO	N	
Parameter	Parameter Data				
Melting Point		800 - 850 °C			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and C	Guideline	None; Experimental; NR			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; Not Reported; NR; NR Notes: white	e asbestos		
Results Details Methods		NR			
Standard Deviation Results		NR			
Results Details		NR			
				NT	
Domain		Matria	EVALUATIO	Commonts	
Domain 1: Substance		Metric	Katilig	Comments	
Domain 1. Substance	Matric 1.	Dapresentativaness	High	Date are measured or estimated for the subject chemical substance	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance.	
	Metric 2.	Appropriateness	Ingn		
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	y Determin	ation	High		

\* Related References: Adapted from IARC 2012 (HERO ID 3970851) and DECOS 2010. Asbestos: Risks of environmental and occupational exposure., The Hague: Health Council of the Netherlands; publication no. 2010/10E (Not in HERO at time of extraction).

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

HERO ID: 9109807 Table: 2 of 3

Study Citation: OECD Harmonized	ECHA, (2021). Melting Point	ECHA scientific report for evaluation of	limit values for a	sbestos at the workplace.
Template:				
HERO ID:	9109807			
			EXTRACTIO	N
Parameter		Data		
Melting Point		600 - 900 °C		
CASRN and Test Material 12172-73-5; Amosite				
Confidentiality, Type, and Guideline None; Experimental; NR				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; Not Reported; NR; NR Notes: brow	n asbestos	
Results Details Methods		NR		
Standard Deviation Results		NR		
Results Details		NR		
				N1
Domain		Metric	EVALUATIO Rating	N Comments
Domain 1: Substance		Wieure	Rating	comments
Domain 1. Substance	Metric 1	Representativeness	High	Data are measured or estimated for the subject chemical substance
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
	1.100110 21		11.8.1	
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Matria 6.	Models	N/A	Rating of this factor is not applicable to this kind of information

\* Related References: Adapted from IARC 2012 (HERO ID 3970851) and DECOS 2010. Asbestos: Risks of environmental and occupational exposure., The Hague: Health Council of the Netherlands; publication no. 2010/10E (Not in HERO at time of extraction).

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

HERO ID: 9109807 Table: 3 of 3

Study Citation: OECD Harmonized	ECHA, (2021). Melting Point	ECHA scientific report for evaluation of	limit values for a	asbestos at the workplace.
Template:	-			
HERO ID:	9109807			
			EXTRACTIO	N
Parameter		Data		
Melting Point		800 - °C		
CASRN and Test Material	1	12001-28-4; Crocidolite		
Confidentiality, Type, and Guideline None; Experimental; NR				
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR				
Radiolabel, Source, State,	and Purity	NR; Not Reported; NR; NR Notes: blue	asbestos	
Results Details Methods		NR		
Standard Deviation Result	ts	NR		
Results Details		NR		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2. Test Reliabi	ility			
2 chian 2. Test Rendor	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	moure 5.	(Method Objectivity)	meanann	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
				- <b>-</b> •
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<u> </u>				
<b>Overall Quali</b>	itv Determi	nation	High	

\* Related References: Adapted from IARC 2012 (HERO ID 3970851) and DECOS 2010. Asbestos: Risks of environmental and occupational exposure., The Hague: Health Council of the Netherlands; publication no. 2010/10E (Not in HERO at time of extraction).

HERO ID: 7924812 Table: 1 of 1

Study Citation:	Elsevier, (2021).	Reaxys: physical-chemical property da	ata for Anthophyl	lite.
OECD Harmonized	Melting Point			
HERO ID:	7924812			
			EXTRACTIO	N
Parameter		Data		
Melting Point		1150 - 1340 °C		
CASRN and Test Material		17068-78-9; Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Results Details Methods		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		1 range reported in Reaxys.		
			EVALUATIO	AT
Domain		Metric	E VALUATIO	Comments
Domain 1: Substance		Wiette	Rating	connients
Domain 1. Substance	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
			U	(e.g., presence of certain functional groups) and/or other physical/chemical properties.
Domain 2: Test Reliabil	itv			
2 0	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
Domain 5: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determin	ation	High	

\* Related References: Sources cited: Brun, A.; Archives des Sciences Physiques et Naturelles; vol. 13; (1902); p. 363, View in Reaxys; Doelter, C.;Tschermaks Mineralogische und Petrographische Mitteilungen; vol. 22; (1903); p. 311, View in Reaxys; Doelter, C.;Handbuch der Mineralchemie. Th. Steinkopf, Dresden-Leipzig. 1911 Bd.2, Tl.1, S.348,354, View in Reaxys; GmelinHandbuch der Anorganischen Chemie; vol. Fe: MVol.B5; 1.8.4, page 1066 - 1069 ; (from Gmelin), View in Reaxys

HERO ID: 7924815 Table: 1 of 1

Study Citation: OECD Harmonized	Elsevier, (2021) Melting Point	. Reaxys: physical-chemical property dat	ta for Actinolite.	
HERO ID:	7924815			
			EXTRACTIO	N
Parameter		Data		
		1140 1006.00		
Melting Point		1140 - 1296 °C		
CASKIN and Test Material	- Suidalina	121/2-6/-/; Actinonite		
Solvent Resetivity Storeg	suldeline	None; Experimental; Not Reported		
Radiolabel Source State a	and Purity	NR: NR: Solid: NR		
Results Details Methods	ind I drity	Not Reported		
Standard Deviation Results		Not Reported		
Results Details		1 range reported in Reaxys. Collected us	ing the search term	'actinolite' in Reaxys.
		g <sub>F</sub>		· · · · · · · · · · · · · · · · · · ·
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
				(e.g., presence of certain functional groups) and/of other physical chemical properties.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
20man 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	

\* Related References: Cusack, R.; ; vol. 4; (1897); p. 399

HERO ID: 7924816 Table: 1 of 1

Study Citation:	Elsevier $(2021)$	Reavys: physical chemical property data	for Richterite	
OECD Harmonized	Melting Point	Reaxys. physical-enemical property data	i foi Rienterite.	
Template:	8			
HERO ID:	7924816			
			EXTRACTIO	N
Parameter Data				
Melting Point		1065 °C		
CASRN and Test Material		17068-76-7; Richterite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Results Details Methods		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		With decomposition. 1 value reported in F	Reaxys.	
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
				(e.g., presence of certain functional groups) and/or other physical/chemical properties.
Domain 2. Test Reliabil	ity			
Domain 2. Test Kendon	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	metric 5.	(Method Objectivity)	mearan	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other	Matria 5.	Databasas	Iliah	
	Metric 5:	Databases	High	I he information or data is from a recognized data collection/repository where data are
				use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
	D.4		TT! - 1	
Overall Qualit	y Determin	auon	High	

\* Related References: Izvestiya Akademii Nauk SSSR, Neorganicheskie Materialy; vol. 22; (1986); p. 1500 - 1505

Study Citation:	Fujishige, M., Sat	Fujishige, M., Sato, R., Kuribara, A., Karasawa, I., Kojima, A. (2006). CaCl2 addition effect and melt formation in low-temperature decomposition of chrysotile with CaCO3. Ceramic Society of Japan. Journal 114(1334):844-848.				
<b>OECD Harmonized</b>	Melting Point					
Template:						
HERO ID:	3581958					
		EXTRACTION				
Parameter		Data				
Melting Point		> 700 - 1000 °C				
CASRN and Test Material		12001-29-5; Chyrsotile				
Confidentiality, Type, and	Guideline	None; experimental; None				
Solvent, Reactivity, Storage	e, and Stability	NR; Yes; NR; decomposition to forsterite and amorphous SiO2 at 800°C				
Radiolabel, Source, State,	and Purity	NR; Kanto Chemical Co., Inc.; Solid; Reported as 1st grade Notes: 1:6 mixtures of chrysotile (Mg6Si4O10(OH)8) and CaCO3 burned at temper-				
		atures of 500 to 1000°C				
Results Details Methods		At 700°C and 800°C for 2 hours decomposition to forsterite was observed; at 1000°C larnite was identified; decomposition, to sintered products				
Standard Deviation Results	5	without the formation of melts, observed at 700°C when trace CaCl2 was present; material heated at temperatures for 2 hours				
Basulta Dataila	5	no reported				
Results Details		Decomposition temperature decreases when asbestos test substance was mixed with CaCO3; addition of CaCl2 further lowers decomposition temperature.				

			EVALUATION	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

Study Citation: OECD Harmonized	Goncharov, Y. I., Kholodova, N. A., Sergeev, N. E. (1991). Amphibole-based thermal-insulating ceramics. 47(7-8):267-270. Melting Point						
HERO ID:	7473172						
			EXTRACTION				
Parameter		Data					
		× (00. %G					
Melting Point		> 600 - °C					
CASKN and Test Material	Cuidalina	Nonec experimental: High temperature has	ting and analysis by a	n v sou differentian mathed			
Solvent Benetivity Storeg	o and Stability	None, experimental; High temperature nea	ung and analysis by a	in x-ray diffraction method			
Padiolabel Source State	and Purity	NA; yes, NK, accomposition NB: ND: Solid: ND Notes: basted with other components as part of correnia material investigation					
Results Details Methods	and Fully	formation of Na-richterite at 800 deg C					
Standard Deviation Results	s	NR	NR				
Results Details	5	Na-richterite formed by firing process at 50	00-1150 deg C range	with magnesium oxide, quartz sand, sodium fluoride			
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	Medium	Data are measured or estimated for the subject chemical substance as part of a mixture.			
Metric 2: Appropriateness		Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	lity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	N	(Method Objectivity)	TT: 1	towards a particular product or outcome.			
	Metric 4:	Kellability/Analytical Method	High	Data are obtained by accepted standard analytical methods.			

<b>Overall Qua</b>	<b>Overall Quality Determination</b>			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				

Study Citation:	IARC, (2012). AR	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and			
OECD Harmonized	anthophyllite). Melting Point				
Template:					
HERO ID:	3970851				
			EXTRACTIO	N	
Parameter		Data			
Melting Point		600 - 900 °C			
CASRN and Test Material		12127-73-5; amosite			
Confidentiality, Type, and C	Buideline	None; not specified; None			
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	None; NR; solid; NR			
Results Details Methods		decomposition temperature			
Standard Deviation Results		Not Reported			
Results Details		Not Reported			
			EVALUATION	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Tast Baliabili	fs.				
Domain 2. Test Kenaum	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	Methe 5.	(Mathad Objectivity)	Medium	towards a particular product or outcome	
	Metric 4.	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information	
		Renability/Finaly deal Wedned	1.011	Runnig of and factor is not appreade to and kind of mornation.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	y Determina	ation	High		

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

Study Citation:	IARC, (2012). A	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and		
OECD Harmonized	Melting Point			
Template:	intening i onno			
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
Melting Point		600 - 850 °C		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and C	Juideline	none; not specified; none		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	None; NR; solid; NR		
Results Details Methods		decomposition temperature		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	ation	High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

Study Citation:	IARC, (2012). Al	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and			
<b>OECD</b> Harmonized	Melting Point				
Template:	0				
HERO ID:	3970851				
			EXTRACTIO	N	
Parameter		Data			
Melting Point		400 - 900 °C			
CASRN and Test Material		12001-28-4; crocidolite			
Confidentiality, Type, and C	Guideline	none; not specified; none			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	None; NR; solid; NR			
Results Details Methods		decomposition temperature			
Standard Deviation Results		Not Reported			
Results Details		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
	• ,				
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	Matria 4.	(Method Objectivity) Reliability (Analytical Mathad	NT/A	Detine of this factor is not analisely to this land of information	
	Meuric 4:	Renability/Analytical Method	IN/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	ty Determin	ation	High		

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

Study Citation:	IARC, (2012). A	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and		
OECD Harmonized	Melting Point			
Template:				
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
Melting Point		950 - 1040 °C		
CASRN and Test Material		77536-68-6; tremolite		
Confidentiality, Type, and C	Guideline	None; not specified; NR		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	None; NR; solid; NR		
Results Details Methods		decomposition temperature		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	ation	High	

Study Citation: OECD Harmonized	Jenkins, D. M., Holland, T. J. B., Clare, A. K. (1991). EXPERIMENTAL-DETERMINATION OF THE PRESSURE-TEMPERATURE STABILITY FIELD AND THERMOCHEMICAL PROPERTIES OF SYNTHETIC TREMOLITE. American Mineralogist 76(3-4):458-469. Melting Point			
Template: HERO ID:	3581993			
_	EXTRACTION			
Parameter	Data			
Melting Point	= 448 - C (decomposition temperature)			
CASRN and Test Material	14567-73-8; synthetic tremolite (calcic amphibole)			
Confidentiality, Type, and	uideline none; experimental/calculation; non-guideline study			
Solvent, Reactivity, Storage	and Stability NA; decomposition; NA; NA			
Radiolabel, Source, State, a	nd Purity NA; prepared by authors in the laboratory; solid; NR			
Results Details Methods	Experimental data (piston cylinder presses at 20-30 kbar, uncertainty: $\pm 200$ bar; chromel-alumel thermocouples, $\pm 5^{\circ}$ C) and calculated univariant curves were used to determine decomposition. Analysis of products was conducted using a Norelco X-ray diffractometer with Ni-filtered Cu radiation			
Standard Deviation Results	$\pm 50$ bars (accuracy in pressure measurements); $\pm 2^{\circ}$ C (accuracy of thermocouples)			
Results Details	Decomposition temperature at 1 bar = 448°C; decomposition to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures of 1.5-7 bar, and decomposition to diopside and talc at temperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C; upper-pressure stability at 798°C = 26.8 kbar.			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qual</b>	ity Determi	ination	High	

-

Study Citation:	<ul> <li>Citation: Kusiorowski, R., Zaremba, T., Gerle, A., Piotrowski, J., Simka, W., Adamek, J. (2015). Study on the thermal decomposition of crocidolite asbestos. Jou of Thermal Analysis and Calorimetry :1585-1595.</li> <li>D Harmonized Melting Point</li> </ul>				
Template: HERO ID:	6879492				
		EXTRACTION			
Parameter		Data			
Melting Point		>= 400 - <= 920 °C			
CASRN and Test Material		12001-28-4; crocidolite			
Confidentiality, Type, and Guideline		none; experimental; Non-guideline; Decomposition and determination of the temperature range of the crocidolite dehydroxylation process evalu- ated from 0-1000°C			
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR			
Radiolabel, Source, State,	and Purity	NR; two samples examined: Republic of South Africa and crocidolite asbestos that was separated from a corrugated asbestos-cement (a-c) slate produced from crocidolite asbestos from USSR; solid; characterized as received without any preliminary preparation Notes: Asbestos samples were studied by differential thermal analysis (DTA) and thermogravimetry (TG/DTG). The mineralogical composition of both the natural and heated samples (after DTA study) was evaluated by X-ray diffraction (XRD).			
Results Details Methods		thermogravimetric analysis with evolved gas analysis (TG-EGA)			
Standard Deviation Results		Not Reported			
Results Details		At 400°C weak endothermic effects indicate dehydroxylation, at 650-700°C weak endothermic effects indicate decomposition of impurities likely carbonates, at 800°C strong endothermic effect for cement sample due to calcite decomposition, and at 900-920°C strong endothermic effects for both may indicate physical melting.			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

HERO ID: 3860485 Table: 1 of 2

Study Citation:	(2017). PubChem	: Chrysotile.		
OECD Harmonized	Melting Point			
Template: HERO ID:	3860485			
			EXTRACTIO	
Parameter		Data		
Melting Point CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Results Details Methods	Guideline e, and Stability nd Purity	1112 - F 12001-29-5; Not Reported Not Reported; Not Reported; Not Reported Not Reported; Not Reported; Not Reported Not Reported Not Reported	l l; Not Reported l; Not Reported	
Results Details		Decomposes		
			EVALUATION	N
Domain		Metric	Rating	Comments
Domain 1: Substance	Metric 1: Metric 2:	Representativeness Appropriateness	High High	Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features (e.g., presence of certain functional groups) or other physical/chemical properties (e.g., if the physical state is described as a liquid, the substance should have a melting point below 25°C and a boiling point above 25°C) or behaviors.
Domain 2: Test Reliabil	its.			
Domain 2. Test Kelldoll	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determina	ation	High	

\* Related References: Source: NIOSH-Pocket Guide (not a primary source); OSHA Occupational Chemical DB (not a primary source); CAMEO Chemicals (not a primary source)

HERO ID: 3860485 Table: 2 of 2

Study Citation: OECD Harmonized	(2017). PubCher Melting Point	n: Chrysotile.		
Template:	C			
HERO ID:	3860485			
			EXTRACTIO	N
Parameter		Data		
Molting Doint		800 850 °C		
CASRN and Test Material		12001-29-5: Not Reported		
Confidentiality, Type, and	Guideline	Not Reported: Not Reported: Not Report	ted	
Solvent, Reactivity, Storage	e, and Stability	Not Reported; Not Reported; Not Report	ted; Not Reported	
Radiolabel, Source, State,	and Purity	Not Reported; Not Reported; Not Report	ted; Not Reported	
Results Details Methods	2	Not Reported		
Standard Deviation Results	8	Not Reported		
Results Details		800-850 deg C. No melting point; decor	nposes.	
			EVALUATIO	Ň
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features (e.g., presence of certain functional groups) or other physical/chemical properties (e.g., if the physical state is described as a liquid, the substance should have a melting point below $25^{\circ}$ C and a boiling point above $25^{\circ}$ C) or behaviors.
Domain 2: Test Reliabil	lity			
2 0	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5. Otter	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	ation	High	

\* Related References: Source: ATSDR; Toxicological Profile for Asbestos. Sept 2001. US Dep of Health and Human Services Agency of Toxic Substances and Disease Registry. Available from, as of Feb 18, 2004: http://www.atsdr.cdc.gov/toxprofiles/tp61.html (not a primary source)

HERO ID: 3860486 Table: 1 of 1

Study Citation: OECD Harmonized	(2017). PubChem Melting Point	a: Crocidolite.		
Template:	intenting I ollit			
HERO ID:	3860486			
			EXTRACTIO	N
Parameter		Data		
Melting Point		1112 F		
CASRN and Test Material	~	12001-28-4; crocidolite		
Confidentiality, Type, and C		none; experimental; NR		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radioladel, Source, State, a	ind Purity	NR; NR; SOIId; NR NOIES: NA		
Standard Daviation Baculta				
Paculte Dataile		INK decomposes		
Results Details		uccomposes		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
Domain 5. Onei	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	ation	High	

\* Related References: Citing OSHA Occupational Chemical DB and CAMEO Chemicals.

HERO ID: 192177 Table: 1 of 1

Study Citation: OECD Harmonized	NIOSH, (2007). Melting Point	NIOSH pocket guide to chemical hazar	ds.		
Template:					
HERO ID:	192177				
			EXTRACTIO	N	
Parameter		Data			
Melting Point		1112 - F			
CASRN and Test Material		1332-21-4; chrysotile, crocidolite, or an	nosite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR			
Results Details Methods		NR			
Standard Deviation Results		NR			
Results Details		decomposes at 1112°F			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical's physical/chemical properties.	
Domain 2: Test Reliabil	itv				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	Analytical method is unknown but is likely to be appropriate based on the data's inclu- sion in a peer-reviewed/recognized database or other secondary source.	
Domain 3: Other					
Domain J. Outer	Metric 5.	Databases	Medium	Data is from a recognized neer-reviewed data collection	
	Metric 6:	Models	N/A	Bating of this factor is not applicable to this kind of information	
	menie 0.	1100015	1 1/2 1	Nating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	Overall Quality Determination High				

HERO ID: 3974865 Table: 1 of 1

Study Citation: NIOSH, (2016). NIOSH pocket guide to chemical hazards: Asbestos.								
OECD Harmonized	Melting Point							
HFRO ID.	3074865							
	3974003							
EXTRACTION								
Parameter		Data						
Melting Point		1112 F						
CASRN and Test Material		1552-21-4; aspestos						
Confidentiality, Type, and Guideline		Not Reported; Not Reported; Not Reported						
Solvent, Reactivity, Storage, and Stability		NK; NK; NK; NK						
Radioladel, Source, State, a	and Purity	None; NK; Solid; NK						
Stendard Deviction Devictor		Not Reported						
Standard Deviation Results Not Reported								
Results Details		decomposes						
			EVALUATION	N				
Domain		Metric	Rating	Comments				
Domain 1: Substance		incure	Ruing	Connicito				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.				
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features				
			6	and/or other physical/chemical properties.				
Domain 2: Tast Daliabil	it.,							
Domain 2: Test Kelladii	Matria 2:	Paliability/Unbiased	Madium	There is no indication that the methodology for moduling the information was biased				
	Wettle 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.				
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's				
				inclusion in a peer-reviewed/recognized database or other secondary source.				
Damain 2. Other								
Domain 3: Other	Matria 5.	Detabasas	Madium	The date are from a course that is known but is missing elements required for High				
	Wietric 5.	Databases	Medium	designation such as peer-review, public availability, or the inclusion of references to				
				original sources.				
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.				
Overall Quality Determination			High					
			Ingli					

HERO ID: 3978149 Table: 1 of 1

Study Citation: OECD Harmonized	NIOSH, (2014). Melting Point	International chemical safety cards (IC	DC): Chrysotile.				
Template: HERO ID:	3978149						
EXTRACTION							
Parameter		Data					
Melting Point		1000 °C					
CASRN and Test Material		12001-29-5; Chrysotile					
Confidentiality, Type, and C	Guideline	None; experimental; Not reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, and Purity		NR; NR; NR; NR Notes: NR					
Results Details Methods		Not Reported					
Standard Deviation Results		NR	1 1 1000	200			
Results Details	Results Details Heat resistant up to 500°C; completely decomposed at 1000°C						
			FVAL HATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance		mouro	Tuning	Connicity			
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features			
			0	(e.g., presence of certain functional groups) or other physical/chemical properties.			
Domain 2: Test Reliabil	ity						
Domain 2. Test Kellauli	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	Wietrie 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.			
Domain 2. Other							
Domain 5: Other	Matric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are			
	Metric 5.	Databases	Figh	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Quality Determination</b>			High				

HERO ID: 3978150 Table: 1 of 1

Tomplato	NIOSH, (2014). International chemical safety cards (ICDC): Crocidolite. Melting Point							
10mp/acc.								
HERO ID: 3978150								
EXTRACTION								
Parameter Data								
Melting Point 1200 °C								
CASRN and Test Material 12001-28-4; Crocidolite								
Confidentiality, Type, and Guideline None; Experimental; Not reported								
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR								
Radiolabel, Source, State, and Purity NR; NR; NR Notes: riebeckite								
Results Details Methods NR								
Standard Deviation Results NR								
Results Details Decomposes below 1200 deg C								
EVALUATION								
Domain Metric Rating	Comments							
Domain 1: Substance								
Metric 1: Representativeness High Data are measured for the s	subject chemical substance.							
Metric 2: Appropriateness High Measured data are consiste	ent with the subject chemical substance structural features							
(e.g., presence of certain fu	incuonai groups) and/or other physical/enemical properties.							
Domain 2: Test Reliability								
Metric 3: Reliability/Unbiased Medium There is no indication that	the methodology for producing the information was biased							
(Method Objectivity) towards a particular produc	ct or outcome.							
Metric 4: Reliability/Analytical Method Medium The analytical method is un	nknown but is likely to be appropriate based on the data's							
inclusion in a peer-reviewe	d/recognized database or other secondary source.							
Domain 2: Other								
Dullialli J. Ullel Matric 5: Databases High The information of data is:	from a reasonized data collection/removitory where data are							
Metric 5. Databases Fign The information of data is in peer-reviewed by experts it	n the field, are broadly available to the public for review and							
use OR includes references	s to the original sources.							
Metric 6: Models N/A Rating of this factor is not a	applicable to this kind of information.							
Overall Quality DeterminationHigh								

HERO ID: 9109830 Table: 1 of 1

Study Citation: OECD Harmonized	NIOSH, (2019). NIOSH pocket guide to chemical hazards: Asbestos. Melting Point						
HERO ID:	9109830						
EXTRACTION							
Parameter		Data					
Melting Point CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity Results Details Methods Standard Deviation Results Results Details		<ul> <li>= 1112 F</li> <li>1332-21-4; Actinolite, Actinolite asbestos, Amosite (cummingtonite-grunerite), Anthophyllite, Anthophyllite asbestos, Chrysotile,Crocidolite (Riebeckite), Tremolite, Tremolite asbestos</li> <li>none; not specified; not specified</li> <li>NR; NR; NR</li> <li>NR; NR; NR Notes: Hydrated mineral silicates</li> <li>not specified</li> <li>not specified</li> <li>decomposes</li> </ul>					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance			TT: 1				
	Metric 1: Metric 2:	Appropriateness	High High	Measured data are consistent with the subject chemical substance.			
Domain 2: Test Reliabil	ity		8				
Domain 2. Test Kendon	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Quality Determination</b>			High				

\* Related References: Primary reference not reported in this secondary source.
Study Citation: OECD Harmonized	NLM, (2021). P Melting Point	ubChem: Hazardous Substance Data B	ank: Chrysotile, 1	2001-29-5.
HERO ID:	7924733			
			EXTRACTIO	N
Parameter		Data		
Melting Point		800 - 850 °C		
CASRN and Test Material	~	12001-29-5; Chrysotile		
Confidentiality, Type, and C	Juideline	None; Experimental; Not Reported		
Badiolabol Source State	, and Stability	INK, INK, INK, INK ND, ND, Solid, ND		
Results Details Methods		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
Results Details		Torrepored		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features and/or other physical/chemical properties.
Domain 2: Test Reliabil	itv			
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	Medium	The analytic method is unknown but is expected to be appropriate based on the study's inclusion in a peer-reviewed database.
Domain 3: Other				
	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	High	

\* Related References: Virta R; Asbestos. Kirk-Othmer Encyclopedia of Chemical Technology. (1999-2018). New York, NY: John Wiley & Sons. Online Posting Date: 15 Jul 2011

HERO ID: 7607109 Table: 1 of 1

Study Citation: OECD Harmonized	OSHA, (2019). A Melting Point	sbestos, all forms.		
Template:	interning i onit			
HERO ID:	7607109			
			EXTRACTION	
Parameter		Data		
Melting Point		550 (1022) - 750 (1382) C (F)		
CASRN and Test Material		1332-21-4; Asbestos		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods		not reported		
Standard Deviation Results		not reported		
Results Details		dehydroxylates at 550-750°C (1022-138	32°F)	
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	Low	Data are measured or estimated for the subject chemical substance; specific form not specified and data is a range corresponding to several CASRN.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	ation	Medium	

\* Related References: Primary source not specified

\_

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

Study Citation:	Poniatowska, A	Poniatowska, A., Andrzejewska-Gorecka, D., Macherzynski, B., Kisiel, M. (2019). Thermal Decomposition of Asbestos Fiber from Asbestos Cement					
OECD Harmonized	Melting Point	Wastes. Rocznik Ochrona Srodowiska 21(2):855-867. Melting Point					
Template:							
HERO ID:	6878583						
		EXTRACTION					
Parameter		Data					
Melting Point		Not Reported					
CASRN and Test Material		12001-29-5; asbestos cement waste					
Confidentiality, Type, and Guideline		None; Experimental; None; thermal analysis using a balance, furnace and scanning electron microscope with Energy Dispersive Spectrometry probe and x-ray diffractometer					
Solvent, Reactivity, Storag	ge, and Stability	NA; NA; NA; NA					
Radiolabel, Source, State,	and Purity	NA; waste from unknown location; solid; NA Notes: NA					
Results Details Methods		Thermal decomposition of cement asbestos slates occurs at 1400-1500 deg C for 120 minutes					
Standard Deviation Results		NR					
Results Details		At 480-520°C dehydroxylation processes of chrysotile, hydrated silicates and aluminosilicates of calcium is observed during thermal analysis; at approximately 820°C final dehydroxylation phases of the components of cement slurry and chrysotile samples is observed; at 1250°C for 120 minutes trace amounts of chrysotile remain; at 1400°C there were no traces of chrysotile based on X-ray diffraction patterns.					

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance physical/chemical properties.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

HERO ID: 3975020 Table: 1 of 5

Study Citation: OECD Harmonized	USGS, (2002). A Melting Point	Asbestos: Geology, mineralogy, mining, a	and uses.			
Template:	U					
HERO ID:	3975020					
			EXTRACTIO	N		
Parameter		Data				
Melting Point		550 - 750 °C				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; NR Notes: NR				
Results Details Methods		Not Reported				
Standard Deviation Results		Not Reported				
Results Details		Decomposition by dehydroxylation of the deg C the resulting magnesium silicate re	e brucite layer begi ecrystallizes to fors	ns at 550 deg C and is completed by 750 deg C with 13% total weight loss. At 800-850 sterite and silica.		
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		

<b>Overall Qua</b>	lity Determi	ination	High	
	Metric 6:	Models	N/A	Not applicable. Rating of this factor is not applicable to this kind of information.
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				

\* Related References: Cites C. Jolicoeur and D. Duchesne, Can. J. Chem. 59(10), 1521 (1981). HEROID 6868399

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

Study Citation: OECD Harmonized	USGS, (2002). A Melting Point	sbestos: Geology, mineralogy, mining,	and uses.		
Template:	Menting I onit				
HERO ID:	3975020				
			EXTRACTIO	N	
Parameter		Data	Linkieno		
Melting Point		950 - 1040 °C			
CASRN and Test Material		14567-73-8: Tremolite			
Confidentiality Type and (	Guideline	None: Experimental: Not Reported			
Solvent Reactivity Storage	and Stability	NR· NR· NR			
Radiolabel Source State a	and Purity	NR: NR: NR NR Notes: NR			
Results Details Methods		Not Reported			
Standard Deviation Results		Not Reported			
Results Details		Residual products: Ca, Mg, and Fe pyrox	kenes, silica		
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Damain 2. Taat Daliahil	·				
Domain 2: Test Kellabil	Ily Matria 2.	Delichility/Inhigoed	Madium	There is no indication that the mathed along for much size the information much is a	
	Metric 5.	(Method Objectivity)	Medium	towards a particular product or outcome	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's	
				inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 2: Other					
Domain 5. Other	Metric 5:	Databases	N/A	Pating of this factor is not applicable to this kind of information	
	Metric 6	Models	N/A N/A	Not applicable. Rating of this factor is not applicable to this kind of information	
	mente 0.	MODELS	11/74	The appreade. Rating of this factor is not appreade to this kind of moffilation.	
Overall Quality Determination			High		

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

Study Citation: OECD Harmonized	USGS, (2002). A Melting Point	sbestos: Geology, mineralogy, mining,	and uses.	
Template:				
HERO ID:	3975020			
			EXTRACTIO	N
Parameter		Data		
Melting Point		400 - 900 °C		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Residual products: Na and Fe pyroxenes	s, hematite, silica	
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
2 onium 2. Test Rendom	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	metrie 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Not applicable. Rating of this factor is not applicable to this kind of information.
				TI T
Overall Quality Determination			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

Study Citation:	USGS, (2002). A	sbestos: Geology, mineralogy, mining,	and uses.			
OECD Harmonized	Melting Point					
Template:	2075020					
HERO ID:	3975020					
Description	EXTRACTION					
Parameter		Data				
		(00, 000 °C				
Melting Point		600 - 900 °C				
CASKIN and Test Material	5	121/2-73-3; Amostee				
Confidentiality, Type, and C		None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NK; NK; NK; NK				
Radiolabel, Source, State, a	ind Purity	NK; NK; NK; NK NOIES: NK				
Stendard Deviation Devolts		Not Reported				
Standard Deviation Results		Rot Reported	a magnetita hamat	ita silisa		
Results Details		Residual products: Fe and Mg pyroxene	s, magnetite, nemai	nte, sinca		
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ity					
2 chian 2. Test Renabili	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)	1110010111	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other	Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Not applicable. Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Melting Point

Study Citation:	USGS, (2002). A	Asbestos: Geology, mineralogy, mining,	and uses.		
OECD Harmonized	Melting Point				
HERO ID.	3975020				
IIERO ID.	3773020			NT .	
Parameter		Data	EATRACIIO	IN	
1 arameter		Data			
Melting Point		400 - 600 °C			
CASRN and Test Material		1332-21-4: Asbestos			
Confidentiality Type and C	Juideline	None: Experimental: Not Reported			
Solvent Reactivity Storage	and Stability	NR: NR: NR: NR			
Radiolabel, Source, State, a	nd Purity	NR: NR: NR: NR Notes: NR			
Results Details Methods		Not Reported			
Standard Deviation Results		Not Reported			
Results Details		Decomposition by dehydroxylation resu and silica.	lting to weight los	s of approximately 2%. Decomposition products are pyroxenes, magnetite, hematite,	
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	itv				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 3: Other					
Domain J. Outer	Metric 5	Databases	N/A	Rating of this factor is not applicable to this kind of information	
	Metric 6:	Models	N/A	Not applicable. Rating of this factor is not applicable to this kind of information	
			1.0.11	The appreaded radies of this factor is not appreaded to this kind of information.	
<b>Overall Oualit</b>	Overall Quality Determination High				

HERO ID: 3827175 Table: 1 of 4

Study Citation:	Virta, R. L. (2011	). Asbestos. :1-40.		
OECD Harmonized	Melting Point			
Template:	2027175			
HERU ID:	3827173			
<b>D</b> (			EXTRACTIO	N
Parameter		Data		
Melting Point		400 - 900 °C		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	luideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Details Methods		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Decomposition		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
				(e.g., presence of certain functional groups) and/or other physical/chemical properties.
Domain 2: Test Reliabili	tv			
2 chian 2. Test Rendom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)	uu	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other	Matria 5.	Datahasaa	NT/A	Desire of this forten is not configurable to this later of information
	Matria 6	Databases	IN/A	Raung of this factor is not applicable to this kind of information.
	Metric 0:	wodels	IN/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	ation	High	

HERO ID: 3827175 Table: 2 of 4

Study Citation: OECD Harmonized	Virta, R. L. (201 Melting Point	1). Asbestos. :1-40.		
Template:	U			
HERO ID:	3827175			
			EXTRACTIO	N
Parameter		Data		
		(00, 050 °C		
Melting Point		600 - 850 °C		
CASKIN and Test Material	Cuidalina	Nanai Experimentali Nat Deported		
Solvent Reactivity Storage	e and Stability	ND. ND. ND. ND		
Radiolabel Source State	and Purity	NR NR NR NR		
Results Details Methods	and Furry	Not Reported		
Standard Deviation Results	3	Not Reported		
Results Details		Decomposition		
		<b>I</b>		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
				(e.g., presence of certain functional groups) and/or other physical/chemical properties.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
				1
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determir	nation	High	

HERO ID: 3827175 Table: 3 of 4

Study Citation: OECD Harmonized	Virta, R. L. (2011) Melting Point	. Asbestos. :1-40.		
Template:	intenting I olin			
HERO ID:	3827175			
			EXTRACTIO	N
Parameter		Data		
		050 1040.00		
Melting Point		950 - 1040 °C		
CASKIN and Test Material	C	//330-08-0; Iremonte		
Solvent Reactivity Storage	Juluellile	None, Experimental, Not Reported		
Radiolabel Source State a	and Purity	NR, NR, NR, NR NR, NR, NR, NR Notes: CAS reported in	n naper 14567-73-	8: based on details reported in document this appear to be for the ashestiform variety
Results Details Methods	ind I unity	Not Reported		b, based on details reported in document this appear to be for the assessmonth variety
Standard Deviation Results		Not Reported		
Results Details		Decomposition		
		1		
			EVALUATIO	Ň
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
				(e.g., presence of certain functional groups) and/or other physical/chemical properties.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
				- **
<b>Overall Qualit</b>	ty Determina	ation	High	

HERO ID: 3827175 Table: 4 of 4

Study Citation: OECD Harmonized	Virta, R. L. (201 Melting Point	1). Asbestos. :1-40.					
Template:							
HERO ID:	3827175						
			EXTRACTIO	N			
Parameter		Data					
Melting Point		600 - 900 °C					
CASRN and Test Material		12172-73-5; Amosite					
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: CAS reported in	in paper: Amosite	[19172-73-5]			
Results Details Methods		Not Reported					
Standard Deviation Results	5	Not Reported	Not Reported				
Results Details		Decomposition					
р .			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance	M ( 1		TT' 1				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features			
				(e.g., presence of certain functional groups) and/of other physical/chemical properties.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's			
				inclusion in a peer-reviewed/recognized database or other secondary source.			
Domain 3: Other							
Domain 5. Outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
				Section of the sectio			
<b>Overall Qualit</b>	ty Determiı	nation	High				

HERO ID: 3859385 Table: 1 of 4

Study Citation:	Virta, R. L. (2004	). Asbestos. 3:288-319.			
OECD Harmonized	Melting Point				
HERO ID.	3859385				
	5657565				
Donomotor		Data	EXTRACTIO	N	
		Data			
Melting Point		400 - 900 °C			
CASRN and Test Material		12001-28-4; crocidolite			
Confidentiality, Type, and C	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR			
Results Details Methods		NR			
Standard Deviation Results		NR			
Results Details		Decomposition temperature = $400-900^{\circ}C$			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance	34.1.4		· · · ·		
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Quality Determination High				

HERO ID: 3859385 Table: 2 of 4

Study Citation: OECD Harmonized	Virta, R. L. (2004). Melting Point	. Asbestos. 3:288-319.		
Template:	2050205			
HERO ID:	3859385			
_		_	EXTRACTIO	N
Parameter		Data		
Melting Point		600 - 850 °C		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods		NR		
Standard Deviation Results		NR		
Results Details		Decomposition temperature = 600-850°C		
D .			EVALUATION	N C A
Domain		Metric	Rating	Comments
Domain 1: Substance	Matria 1.	Demagentativeness	High	Data and management and attended for the multiple to the milest substance.
	Metric 1: Metric 2:	Appropriateness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2.	Appropriateness	Ingn	weasured data are consistent with the subject chemical substance structural reatures.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other	Matria 5.	Databasas	I Lah	The information on data is from a macanized data and the first from site monthand data
	Metric 5:	Databases	High	peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determina	ation	High	

HERO ID: 3859385 Table: 3 of 4

Study Citation: OECD Harmonized	Virta, R. L. (2004). Melting Point	. Asbestos. 3:288-319.		
Template:				
HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
Melting Point		600 - 900 °C		
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NK; NK; NK ND: ND: ND ND Notes: ND		
Results Details Methods		NR; NR; NR; NR NOIES: NR NR		
Standard Deviation Results		NR		
Results Details	,	Decomposition temperature = $600-900^{\circ}C$		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
Domain 2. Test Kellauli	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	mourie 5.	(Method Objectivity)	Weatum	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determina	ation	High	

HERO ID: 3859385 Table: 4 of 4

Study Citation: OECD Harmonized	Virta, R. L. (2004). Melting Point	. Asbestos. 3:288-319.		
Template:	C			
HERO ID:	3859385			
		]	EXTRACTIO	N
Parameter		Data		
Melting Point		950 - 1040 °C		
CASRN and Test Material		14567-73-8; tremolite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NK; NK; NR; NR Notes: NR		
Results Details Methods		NR		
Standard Deviation Results		NR		
Results Details		Decomposition temperature = 900-1040°C		
			FVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance			6	
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
	•,			
Domain 2: Test Reliabil	ity		Mallin	
	Metric 3:	(Method Objectivity)	Medium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was
				used.
Domain 3: Other				
Domain 5. Other	Metric 5	Databases	High	The information or data is from a recognized data collection/repository where data are
	Weule 5.	Databases	Ingn	peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determina	ation	High	

Study Citation:	Yoshikawa, N., K	Yoshikawa, N., Kashimura, K., Hashiguchi, M., Sato, M., Horikoshi, S., Mitani, T., Shinohara, N. (2015). Detoxification mechanism of asbestos materials by microwave treatment. Journal of Hazardous Materials 284(Elsevier):201-206					
<b>OECD Harmonized</b>	Melting Point	by microwave treatment. Journal of Hazardous Materials 284(Elsevier):201-206. Melting Point					
Template:	U						
HERO ID:	3531606						
		EXTRACTION					
Parameter		Data					
Melting Point		Not Reported					
CASRN and Test Material		not reported; Mg3Si4O12 (talc) as a quasi-asbestos material was used to obtain an adequate sample for testing					
Confidentiality, Type, and	Guideline	None; Experimental; NR					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NA; NR; Solid; NR					
Results Details Methods	-	100 W microwave treatment					
Standard Deviation Results		Not Reported					
Results Details		Initial asbestos fibers present (49-55 present) decreased to 0 at $>$ 900 deg C. Micro-hot spots in the CaO phase of asbestos reached $>$ 1200 deg					
		C which decomposed the fibers. At $> 1000 \text{ deg C}$ , tangled fibers unraveled and expanded slightly into the interface between chrysotile fibers and tangled fibers and CaO melted away. Thermal runaway was observed at 720 seconds.					

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	Medium	Data are measured for a structurally similar chemical substance.
	Metric 2:	Appropriateness	Medium	Data measured for a structural analogue of the subject chemical substance are consistent with what is expected for the subject chemical substance structural properties, features or behaviors.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quali	ty Determ	ination	Medium	

HERO ID: 3860485 Table: 1 of 1

Study Citation:	(2017). PubChe	em: Chrysotile.		
OECD Harmonized	Boiling Point			
Template: HERO ID:	3860485			
	2000102		FXTRACTIO	N
Parameter		Data	EATRACTIO	1
Boiling Point		Not Reported		
CASRN and Test Material		12001-29-5; Not Reported		
Confidentiality, Type, and	Guideline	Not Reported; No	rted	
Solvent, Reactivity, Storag	e, and Stability	Not Reported; No	rted; Not Reported	
Radiolabel, Source, State,	and Purity	Not Reported; No	rted; Not Reported	
Standard Deviation Results	8	Not Reported		
Results Details		Decomposes		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
				(e.g., presence of certain functional groups) or other physical/chemical properties (e.g.,
				below $25^{\circ}$ C and a boiling point above $25^{\circ}$ C) or behaviors.
Domain 2: Test Reliabil	lity			
2 onium 2. Test Rendom	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	metrie 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
				peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Oneli	ty Dotormi	nation	High	
Over all Quali	iy Determin	liauvii	Ingu	

\* Related References: Source: NIOSH-Pocket Guide (not a primary source); OSHA Occupational Chemical DB (not a primary source); CAMEO Chemicals (not a primary source)

HERO ID: 3974865 Table: 1 of 1

Study Citation:	NIOSH, (2016).	. NIOSH pocket guide to chemical haza	rds: Asbestos.	
OECD Harmonized	Boiling Point			
Template:				
HERO ID:	3974865			
			EXTRACTIO	N
Parameter		Data		
Boiling Point		not reported		
CASRN and Test Material		1332-21-4; Asbestos		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Standard Deviation Results	6	Not Reported		
Results Details		Decomposes.		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
				(e.g., presence of certain functional groups) and/or other physical/chemical properties.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3. Other				
Domain 5. Outer	Metric 5:	Databases	Medium	The data are from a source that is known but is missing elements required for High
	metric 5.	Dunouses	mean	designation such as peer-review, public availability, or the inclusion of references to
				original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	
	iy Determin	nauvii	Ingii	

\* Related References: None cited.

HERO ID: 786664 Table: 1 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Density	Toxicological profile for asbestos (Up	odate, September 2	001).
Template:	,			
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Density		3.43 unitless		
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Density Type		specific gravity		
System		not specified		
Duration		not specified		
Standard Deviation Results		not specified		
Results Details		not specified		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 2: Other				
Domain 5: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	nation	High	

HERO ID: 786664 Table: 2 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Density	Toxicological profile for asbestos (Up	odate, September 20	001).	
Template:					
HERO ID:	786664				
			EXTRACTIO	N	
Parameter		Data			
Density		2.9 - 3.2 unitless			
CASRN and Test Material		14567-73-8; tremolite			
Confidentiality, Type, and	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR			
Density Type		specific gravity			
System		not specified			
Duration		not specified			
Standard Deviation Results	1	not specified			
Results Details		not specified			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabil	itv				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome	
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.	
Domain 3: Other					
2 ontain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Quality Determination High				

HERO ID: 786664 Table: 3 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Density	Toxicological profile for asbestos (Upo	date, September 2	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Density		2.55 unitless		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NK; NK; NK; NK Notes: NR		
Density Type		specific gravity		
System		not specified		
Duration		not specified		
Standard Deviation Results		not specified		
Results Details		not specified		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2. Test Reliabil	ity			
Domani 2. Test Reliabili	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination				

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Density

### HERO ID: 786664 Table: 4 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Density	Toxicological profile for asbestos (Up	odate, September 2	001).
Template:	-			
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Density		2.85 - 3.1 unitless		
CASRN and Test Material		17068-78-9; anthophyllite		
Confidentiality, Type, and Confidentiality, and	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Density Type		specific gravity		
System		not specified		
Duration		not specified		
Standard Deviation Results	5	not specified		
Results Details		not specified		
р .			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	36.1.4		TT' 1	
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Damain 2. Out				
Domain 3: Other	Matria 5.	Detahagag	High	
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determiı	nation	High	

HERO ID: 786664 Table: 5 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). Density	Toxicological profile for asbestos (Up	date, September 2	001).
Template: HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data	LAIRACIIO	
Density		3.37 unitless		
CASRN and Test Material		12001-28-4; crocidolite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Density Type		specific gravity		
System		not specified		
Duration		not specified		
Standard Deviation Results		not specified		
Results Details		not specified		
Domain		Matria	EVALUATIO. Doting	Commonts
Domain 1: Substance		Metric	Katilig	Comments
Domain 1. Substance	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance,
	Wette 2.	Appropriateness	Ingn	Measured data are consistent with the subject enernical substance structural reatures.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other	Matric 5	Databasas	High	The information or data is from a recognized data collection/repository where data are
	Metric 5:	Databases	nigii	peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>				

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

April 2024 Density

HERO ID: 3646977 Table: 1 of 3

Study Citation: OECD Harmonized	Gaze, R. (1965). Density	e, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30. sity					
HERO ID:	3646977						
			EXTRACTION				
Parameter		Data					
Density		= 3.37 - unit basis not specified					
CASRN and Test Material		12001-28-4; Crocidolite					
Confidentiality, Type, and C	Guideline	none; not specified; not specified					
Solvent, Reactivity, Storage							
Radiolabel, Source, State, and Purity NR; NR; Solid; NR Notes: blue asbestos; chemical formula Na2O 3FeO Fe2O3 8SiO2 H2O							
Density Type		Specific gravity					
System		not specified					
Duration		Not reported					
Standard Deviation Results		Not reported					
Results Details		Not reported					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	Medium	Details have been omitted.			
Domain 2: Test Reliabili	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3 <sup>,</sup> Other							
Domain 5. Outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	y Determin	nation	Medium				

HERO ID: 3646977 Table: 2 of 3

Study Citation: OECD Harmonized	Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30. Density			the New York Academy of Sciences 132:23-30.			
HERO ID:	3646977						
	EXTRACTION						
Parameter		Data					
Density CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Density Type System Duration Standard Deviation Results Results Details	Guideline e, and Stability nd Purity	= 3.45 - unit basis not specified 12172-73-5; Amosite none; not specified; not specified NR; NR; NR; NR NR; NR; Solid; NR Notes: chemical forr Specific gravity not specified Not reported Not reported Not reported	nula 1.5MgO 5.5FeO 8Si	iO2 H2O			
Domain		Metric	EVALUATION Rating	Comments			
Domain 1: Substance		Weute	Ruting	Connicito			
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	Medium	Details have been omitted.			
Domain 2: Test Reliabili	ity						
Domain 2. Test Rendom	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
Domain J. Outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Qualit	y Determin	ation	Medium				

HERO ID: 3646977 Table: 3 of 3

Study Citation:	Gaze, R. (1965). T	The Physical and Molecular Structure of	of Asbestos. Annals of	the New York Academy of Sciences 132:23-30.
Tomplete:	Density			
HERO ID:	3646977			
			EXTRACTION	
Parameter		Data		
Density		= 2.55 - unit basis not specified		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Buideline	none; not specified; not specified		
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR Notes: white asbest	os; chemical formula 3Mg	O 2SiO2 2H2O
Density Type		Specific gravity		
System		not specified		
Duration	ation Not reported			
Standard Deviation Results		Not reported		
Results Details		Not reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	Medium	Details have been omitted.
Domain 2. Test Reliabili	tv			
2 omain 2. Test Reliabili	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Metric 5.	(Method Objectivity)	Medium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Demain 2: Other				
Domain 3: Other	Matria 5.	Databasas	N1/A	Define a fabile for the international includes the bird of information
	Metric 5:	Models	IN/A N/A	Rating of this factor is not applicable to this kind of information.
	Metric 0:	wodels	IN/A	rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determina	ation	Medium	

HERO ID: 3982121 Table: 1 of 1

\_

Study Citation: OECD Harmonized	Larranaga, M. D., Lewis, R. J., Lewis, R. A. (2016). Ascorbic acid. :117. ized Density				
Template:	•				
HERO ID:	3982121				
			EXTRACTION		
Parameter		Data			
Density		2.5 - Not reported			
CASRN and Test Material		1332-21-4; asbestos			
Confidentiality, Type, and C	Guideline	None; experimental; NR			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR			
Density Type		density			
System		NR			
Duration		NR			
Standard Deviation Results		NR			
Results Details		NR			
			EVALUATION		
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	ity				
Domain 2. Test Kendull	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	Metric 5.	(Method Objectivity)	Wiedrum	towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Low	Units not reported but expected to be g/cm3.	
		5 5			
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	y Determin	nation	Medium		

Asbestos

\_

Starder Citestiener	(2017) Dub Char							
OECD Harmonized	(2017). PubCilei Density	in: Chrysothe.						
Template:	Density							
HERO ID:	3860485							
			EXTRACTIO	N				
Parameter		Data						
Density		2.2 - 2.6 g/cm3						
CASRN and Test Material		12001-29-5: Not Reported	12001-29-5: Not Reported					
Confidentiality, Type, and C	Guideline	Not Reported; Not Reported; Not Repor	ted					
Solvent, Reactivity, Storage	e, and Stability	Not Reported; Not Reported; Not Repor	ted; Not Reported					
Radiolabel, Source, State, a	nd Purity	Not Reported; Not Reported; Not Repor	ted; Not Reported					
Density Type		density						
System		Not Reported						
Duration		Not Reported						
Standard Deviation Results		Not Reported						
Results Details		2.2-2.6 g/cm3						
			EVALUATIO	N				
Domain		Metric	Rating	Comments				
Domain 1: Substance								
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.				
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features				
				(e.g., presence of certain functional groups) or other physical/chemical properties (e.g.,				
				below $25^{\circ}$ C and a boiling point above $25^{\circ}$ C) or behaviors.				
Domain 2: Test Reliabili	ity							
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased				
		(Method Objectivity)		towards a particular product or outcome.				
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was				
				usea.				
Domain 3: Other								
Domain 5. Other	Metric 5.	Databases	High	The information or data is from a recognized data collection/repository where data are				
	metric 5.	Dutuousos	mgn	peer-reviewed by experts in the field, are broadly available to the public for review and				
				use OR includes references to the original sources.				
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.				
			<b>TT</b> 1					
<b>Overall Qualit</b>	y Determin	nation	High					

\* Related References: Source: ILO-ICSC (not a primary source)

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Density

Study Citation: OECD Harmonized	(2017). PubChe Density	em: Chrysotile.		
Template:	3860485			
	5600+85		EVTRACTIO	N
Parameter		Data	EATRACIIO	1
Density		2.19 - 2.56 g/cm3		
CASRN and Test Material		12001-29-5; Not Reported		
Confidentiality, Type, and	Guideline	Not Reported; Not Reported; Not Repor	ted	
Solvent, Reactivity, Storag	e, and Stability	Not Reported; Not Reported; Not Report	ted; Not Reported	
Radiolabel, Source, State,	and Purity	Not Reported; Not Reported; Not Report	rted; Not Reported	
Density Type		density		
System		Not Reported		
Duration		Not Reported		
Standard Deviation Results	8	Not Reported		
Results Details       Chrysotile from Arizona, derived from serpentized de         These reported ranges in density have been attribute       central capillaries and fibril interstices in the fiber but			erpentized dolimite been attributed to m n the fiber bundle.	s reported to be between 2.19 & 2.25 g/mL; chrysotile from Canada approx. 2.56 g/mL. ineral impurities and to the presence of magnesium silicate material that "stuffs" the
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features (e.g., presence of certain functional groups) or other physical/chemical properties (e.g., if the physical state is described as a liquid, the substance should have a melting point below 25°C and a boiling point above 25°C) or behaviors.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quali	ty Determi	nation	High	

\* Related References: Source: IARC. Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans. Geneva: World Health Organization, International Agency for Research on Cancer, 1972-PRESENT. (Multivolume work). Available at:http://monographs.iarc.fr/ENG/Classification/index.php , p. V14 21 (1977) (not a primary source)

HERO ID: 3860486 Table: 1 of 1

Template: HERO ID: 3860486 Parameter Data	EXTRACTIO	N
HERO ID: 3860486 Parameter Data	EXTRACTION	N
Parameter Data	EXTRACTIO	N
Parameter Data		N
Density 3.3 - 3.4 not reported		
CASRN and Test Material 12001-28-4; crocidolite		
Confidentiality, Type, and Guideline none; experimental; not reported		
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR		
Radiolabel, Source, State, and Purity NR; NR; solid; NR Notes: NR		
Density Type density		
System not reported		
Duration NR		
Standard Deviation Results NR		
Results Details NR		
	EVALUATION	N
Domain Metric	Rating	Comments
Domain 1: Substance		
Metric 1: Representativeness	High	Data are measured or estimated for the subject chemical substance.
Metric 2: Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliability		
Metric 3: Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
Metric 4: Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3. Other		
Metric 5: Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
Metric 6: Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination	High	

\* Related References: Citing ILO-ICSC.

HERO ID: 3978149 Table: 1 of 1

Study Citation: OECD Harmonized	NIOSH, (2014). Density	International chemical safety cards (IC	CDC): Chrysotile.	
HERO ID:	3978149			
			EXTRACTIO	N
Parameter		Data		
Density		2.2 - 2.6 g/cm3		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Buideline	None; experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
Density Type		density		
System		Not reported		
Standard Deviation Results		NR		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytic method is unknown but is expected to be appropriate based on the study's inclusion in a peer-reviewed database.
Domain 3. Other				
Domain 5. Oulor	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determin	nation	High	~ ^^

HERO ID: 3978150 Table: 1 of 1

Study Citation: OECD Harmonized	NIOSH, (2014). Density	International chemical safety cards (IC	DC): Crocidolite.	
HERO ID:	3978150			
			EXTRACTIO	N
Parameter		Data		
Density CASRN and Test Material Confidentiality, Type, and O Solvent, Reactivity, Storage Radiolabel, Source, State, a Density Type System Duration Standard Deviation Results Results Details	Guideline 2, and Stability and Purity	3.3 - 3.4 (water =1) 12001-28-4; Crocidolite None; Experimental; Not reported NR; NR; NR; NR NR; NR; NR Notes: riebeckite Relative density Not reported Not Reported NR Not Reported		
Domain		Metric	EVALUATIO	Comments
Domain 1: Substance		Metric	Rating	connients
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2 <sup>.</sup> Test Reliabil	ity			
2 chian 2. Test Rendon	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determin	ation	High	

HERO ID: 3975020 Table: 1 of 4

Study Citation: OECD Harmonized	USGS, (2002). Asbestos: Geology, mining, and uses. Density							
HERO ID:	3975020							
EXTRACTION								
Parameter		Data						
Density CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity Density Type System Duration Standard Deviation Results		2.9 - 3.2 14567-73-8; tremolite Not Reported; Not Reported; not reported NR; NR; NR; NR NR; NR; NR specific gravity Not Reported Not Reported Not Reported specific gravity						
Results Details		specific gravity						
		E	VALUATIO	N				
Domain		Metric	Rating	Comments				
Domain 1: Substance	Metric 1: Metric 2:	Representativeness Appropriateness	High High	Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features or other physical/chemical properties or behaviors.				
Domain 2. Test Kenabh	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.				
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.				
Domain 3: Other								
	Metric 5: Metric 6:	Databases Models	N/A N/A	Rating of this factor is not applicable to this kind of information. Rating of this factor is not applicable to this kind of information.				
<b>Overall Quality Determination</b>			High					

HERO ID: 3975020 Table: 2 of 4

Template:         3975020	RACTION							
HERO ID: 3975020	RACTION							
	RACTION							
EXTRACTION								
Parameter Data								
Density 3.1 - 3.25								
CASRN and Test Material 12172-73-5; amosite								
Confidentiality, Type, and Guideline Not Reported; Not Reported; not reported	Not Reported; Not Reported; not reported							
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR	NR; NR; NR							
Radiolabel, Source, State, and Purity NR; NR; NR; NR								
Density Type specific gravity								
System Not Reported								
Duration Not Reported								
Standard Deviation Results Not Reported								
Results Details specific gravity								
EVAL	LUATION							
Domain Metric I	Rating	Comments						
Domain 1: Substance								
Metric 1: Representativeness	High	Data are measured or estimated for the subject chemical substance.						
Metric 2: Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or						
		other physical/chemical properties or behaviors.						
Domain 2: Test Reliability								
Metric 3: Reliability/Unbiased M	Medium	There is no indication that the methodology for producing the information was biased						
(Method Objectivity)		towards a particular product or outcome.						
Metric 4: Reliability/Analytical Method M	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.						
Domain 3: Other								
Metric 5: Databases	N/A	Rating of this factor is not applicable to this kind of information.						
Metric 6: Models	N/A	Rating of this factor is not applicable to this kind of information.						
Overall Quality Determination H	High							

HERO ID: 3975020 Table: 3 of 4

Study Citation: OECD Harmonized	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses. Density							
Template:								
HERO ID:	3975020							
EXTRACTION								
Parameter		Data						
Density		3.2 - 3.3						
CASRN and Test Material		12001-28-4; crocidolite						
Confidentiality, Type, and Guideline		Not Reported; Not Reported; not reported						
Solvent, Reactivity, Storage, and Stability		NR; NR; NR						
Radiolabel, Source, State, and Purity		NR; NR; NR						
Density Type		specific gravity						
System		Not Reported						
Duration		Not Reported						
Standard Deviation Results	Standard Deviation Results Not Reported							
Results Details		specific gravity						
		E	VALUATIO	N				
Domain		Metric	Rating	Comments				
Domain 1: Substance								
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.				
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or				
				other physical/chemical properties or behaviors.				
Domain 2: Tast Paliability								
2 onium 2. Test Kellauli	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased				
	metric 5.	(Method Objectivity)	meanum	towards a particular product or outcome.				
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's				
				inclusion in a peer-reviewed/recognized database or other secondary source.				
Domain 2: Other								
Domain J. Outer	Metric 5 <sup>.</sup>	Databases	N/A	Rating of this factor is not applicable to this kind of information				
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.				
		-						
<b>Overall Quality Determination</b>								
			8-					
HERO ID: 3975020 Table: 4 of 4

Study Citation: OFCD Harmonized	USGS, (2002).	Asbestos: Geology, mineralogy, mining, an	d uses.	
Template:	Density			
HERO ID:	3975020			
		Ι	EXTRACTIO	N
Parameter		Data		
Density		2.4 - 2.6		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and	Guideline	Not Reported; Not Reported; not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Density Type		specific gravity		
System		Not Reported		
Duration		Not Reported		
Standard Deviation Results	5	Not Reported		
Results Details		specific gravity		
		]	EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or
				other physical/chemical properties or behaviors.
Domain 2. Test Reliabil	ity			
Domain 2. Test Kelldull	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Wieure 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Damain 2. Od				
Domain 3: Other	Matria 5.	Databagag	NT/A	Define of this forten is not confirmed to this himd of information
	Metric 5:	Databases Madala	IN/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	IN/A	Kating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	High	

HERO ID: 3859385 Table: 1 of 4

Study Citation: OECD Harmonized	Virta, R. L. (2004) Density	). Asbestos. 3:288-319.		
HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
Density CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Density Type System Duration Standard Deviation Results Results Details	Guideline e, and Stability nd Purity	2.9 - 3.2 14567-73-8; tremolite none; not specified; not specified NR; NR; NR; NR NR; NR; NR; NR Notes: NR specific gravity not reported not reported not reported not reported		
			FVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	tv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	ation	High	

HERO ID: 3859385 Table: 2 of 4

Study Citation: OECD Harmonized	Virta, R. L. (2004). Density	Asbestos. 3:288-319.		
Template: HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
Density		3.2 - 3.3		
CASRN and Test Material		12001-28-4; crocidolite		
Confidentiality, Type, and C		none; not specified; not specified		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radioladel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
System		specific gravity		
Duration		not reported		
Standard Deviation Results		not reported		
Results Details		not reported		
Results Details		liot reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determina	ntion	High	

HERO ID: 3859385 Table: 3 of 4

Study Citation: OECD Harmonized	Virta, R. L. (2004 Density	). Asbestos. 3:288-319.		
Template:	3850385			
	3837383			
Denometer		Data	EXTRACTIO	N
Parameter		Data		
Densites		24.26		
CASEN and Test Material		2.4 - 2.0 12001-29-5: chrysotile		
Confidentiality Type and (	Juideline	none: not specified: not specified		
Solvent Reactivity Storage	and Stability	NR · NR · NR		
Radiolabel, Source, State, a	and Purity	NR: NR: NR NR Notes: NR		
Density Type	und i di tuj	specific gravity		
System		not reported		
Duration		not reported		
Standard Deviation Results		not reported		
Results Details		not reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	itv			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5. Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determin	ation	High	

HERO ID: 3859385 Table: 4 of 4

Study Citation: OECD Harmonized	Virta, R. L. (200 Density	4). Asbestos. 3:288-319.		
Template: HERO ID:	3859385			
			FYTRACTIO	N
Parameter		Data	EATRACTIO	1
Density CASRN and Test Material		3.1 - 3.25 12172-73-5; amosite		
Confidentiality, Type, and C Solvent, Reactivity, Storage	Juideline , and Stability	none; not specified; not specified NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
Density Type		specific gravity		
System		not reported		
Duration		not reported		
Standard Deviation Results		not reported		
Results Details		not reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determir	nation	High	

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

HERO ID: 7924810 Table: 1 of 1

Study Citation: OECD Harmonized	Elsevier, (2021) Density	. Reaxys: physical-chemical property da	ata for Chrysotile.	
Template:				
HERO ID:	7924810			
			EXTRACTIO	N
Parameter		Data		
Density		2.219 - 2.68 g/cm3		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR		
Duration		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Crystallographic density; 3 values were	reported in Reaxys,	in the range of 2.219 - 2.68.
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Metric 1:	(Method Objectivity) Reliability/Analytical Method	Medium	towards a particular product of outcome. The analytical method is unknown but is likely to be appropriate based on the deta's
	Meule 4.	Kenability/Anarytical Method	Weatum	inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	High	

\* Related References: Graham, R. P. D.; Economic Geology; vol. 12; (1917); p. 188; Dana, E. S.; A System of Mineralogy, 6.Ed., New York-London p. 671.

Density

HERO ID: 7924812 Table: 1 of 1

Study Citation: OECD Harmonized	Elsevier, (2021). Density	. Reaxys: physical-chemical property da	ata for Anthophyl	lite.
Template: HERO ID:	7924812			
	7721012		EVTDACTIO	N
Parameter		Data	EATRACIIO	1
Density		3.09 g/cm3		
CASRN and Test Material		17068-78-9; Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Duration		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Crystallographic density. 1 value report	ed in Reaxys.	
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	Measured data are consistent with the subject chemical substance structural features
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determin	nation	High	

\* Related References: Walitzi, E. M.; Walter, F.; Ettinger, K., Zeitschrift fur Kristallographie, 1989, vol. 188, p. 237 - 244.

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

HERO ID: 7924815 Table: 1 of 1

Study Citation: OECD Harmonized	Elsevier, (2021). Density	Reaxys: physical-chemical property da	ta for Actinolite.	
Template:	7024815			
HERO ID:	/924815			
_			EXTRACTIO	N
Parameter		Data		
Density		2.9 - 3.1 g/cm3		
CASRN and Test Material		12172-67-7; Actinolite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Duration		Not Reported		
Standard Deviation Results	1	Not Reported		
Results Details		Crystallographic. 1 range reported in Re	axys. Collected usi	ng the search term 'actinolite' in Reaxys.
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
Domain 2. Test Rendom	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	metale 5.	(Method Objectivity)	mearum	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 2: Other				
Domain J. Oulei	Metric 5	Databases	High	The information or data is from a recognized data collection/repository where data are
	Metric 5.	Databases	Ingn	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	nation	High	

\* Related References: Handbuch der Mineralchemie. Th. Steinkopff, Dresden-Leipzig, Vol. 2, part 1, p. 510

Density

HERO ID: 5333260 Table: 1 of 2

Study Citation: OECD Harmonized	Larrañaga, M. I Density	D., Lewis, R. J., Lewis, R. A. (2016). Hawl	ey's condensed cher	nical dictionary. :57, 58, 1232.
Template: HFRO ID:	5333260			
	5555200			
Parameter		Data	EXTRACTION	
		Data		
Density		30-33 units not given assumed to be $g/c$	·m3	
CASRN and Test Material		77536-68-6: Tremolite	into (	
Confidentiality Type, and (	Guideline	None: Experimental: Not reported		
Solvent. Reactivity. Storage	e, and Stability	NR: NR: NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Duration	5	Not Reported		
Standard Deviation Results		Not reported		
Results Details		Not reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Test Reliabil	ity			
2 sinuin 2. Test Rendon	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	Units not reported but expected to be g/cm3.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	Medium	

\* Related References: HEROID: 8001314

HERO ID: 5333260 Table: 2 of 2

Study Citation: OECD Harmonized	Larrañaga, M. D Density	., Lewis, R. J., Lewis, R. A. (2016). Hawle	y's condensed chem	ical dictionary. :57, 58, 1232.
Template:	•			
HERO ID:	5333260			
		Ι	EXTRACTION	
Parameter		Data		
Density		2.5 units not given, assumed to be g/cm3		
CASRN and Test Material		1332-21-4; Asbestos		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Duration		Not Reported		
Standard Deviation Results		Not reported		
Results Details		Not reported		
		]	EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
	•,			
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Matria 4	(Method Objectivity) Reliability/Analytical Mathad	Low	Inite not reported but expected to be g/gm2
	Meure 4.	Renability/Analytical Method	LOW	Chils not reported but expected to be g/cin3.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	nation	Medium	

\* Related References: HEROID: 8001410

PUBLIC RELEASE DRAFT - DO NOT CITE OR QUOTE April 2024

#### Density

HERO ID: 7924733 Table: 1 of 2

Study Citation: OECD Harmonized	NLM, (2021). F Density	PubChem: Hazardous Substance Data Bar	nk: Chrysotile, 12001	-29-5.			
Template:	•						
HERO ID:	7924733						
	EXTRACTION						
Parameter		Data					
Density		2.4 - 2.6 units not given, assumed to be g	/cm3				
CASRN and Test Material		12001-29-5; Chrysotile					
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR					
Duration		Not Reported					
Standard Deviation Results		Not Reported					
Results Details		Specific gravity					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.			
		(Method Objectivity)		<i>6</i> , <i>1</i>			
	Metric 4:	Reliability/Analytical Method	Low	Units not reported but expected to be g/cm3.			
Domain 3: Other							
Domain 5. Outer	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	ty Determi	nation	Medium				

\* Related References: Virta R; Asbestos. Kirk-Othmer Encyclopedia of Chemical Technology. (1999-2018). Virta R; Asbestos. Kirk-Othmer Encyclopedia of Chemical Technology. (1999-2018). New York, NY: John Wiley & Sons. Online Posting Date: 15 Jul 2011

#### HERO ID: 7924733 Table: 2 of 2

Study Citation: OECD Harmonized	NLM, (2021). F Density	PubChem: Hazardous Substance Data Ba	nk: Chrysotile, 1	2001-29-5.
HERO ID:	7924733			
			EXTRACTIO	N
Parameter		Data		
Density		2.19 - 2.56 g/mL		
CASRN and Test Material	a	12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Duration		Not Reported		
Standard Deviation Results	5	Not Reported		
Results Details		Arizona chystolies (derived from serper impurities or presence of magnesium sili	cate.	2.19 - 2.25 g/mLCanada chrystolite: 2.56 g/mLDensity ranges attibuted to mineral
			EVALUATIO	N
Domain		Metric	E VALUATIO. Rating	Comments
Domain 1: Substance		Wettle	Kating	Comments
Domain 1. Substance	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
				e e e e e e e e e e e e e e e e e e e
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
		(Method Objectivity)		
	Metric 4:	Reliability/Analytical Method	Medium	The analytic method is unknown but is expected to be appropriate based on the study's inclusion in a peer-reviewed database.
Domain 3 <sup>.</sup> Other				
Domain 5. Outer	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information
	metrie 0.		1.1/1	Reading of and factor is not approache to and kind of information.
<b>Overall Oualit</b>	ty Determi	nation	High	

\* Related References: IARC. Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans. Geneva: World Health Organization, International Agency forResearch on Cancer, 1972-PRESENT. (Multivolume work). p. V14: 12 (1977)

\_

\_

Study Citation: OECD Harmonized	Zhong, Q., Liao Density	, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Blac	k Nephrite Jade	from Guangxi, Southern China. Gems & Gemology 55(2):198-215.
Template:	6880237			
	0880237			NT .
Daramatar		Data	EXTRACTIO	N
		Data		
Density		3.015 - 3.149 units not given assumed to	he g/cm3	
CASRN and Test Material		12172-67-7: Actinolite	be greins	
Confidentiality, Type, and	Guideline	None: Experimental: Other		
Solvent, Reactivity, Storage, and Stability		NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Duration	2	Not Reported		
Standard Deviation Results		Not reported		
Results Details		Specific gravity 3.015-3.149; measured u	sing hydrostaticall	y; 8 samples containing 65 to >98% actinolite
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
Domain 2. Test Rendom	Metric 3	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
	medie 5.	(Method Objectivity)	mgn	tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	Low	Units not reported but expected to be g/cm3.
Domain 3: Other				
	Metric 5:	Databases	High	Data is from a recognized, peer-reviewed data collection.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
		•	TT• 1	
Overall Qualit	y Determi	nation	High	

HERO ID: 6880237 Table: 2 of 2

Study Citation: OECD Harmonized	Zhong, Q., Liao Density	, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Bla	ck Nephrite Jade	from Guangxi, Southern China. Gems & Gemology 55(2):198-215.			
HERO ID:	6880237	6880237					
	EXTRACTION						
Parameter		Data					
Density 3.161 - 3.405 units not given, assumed to be g/cm3							
CASRN and Test Material		12172-67-7; Actinolite					
Confidentiality, Type, and Guideline		None; Experimental; Other					
Solvent, Reactivity, Storage, and Stability		NR; NR; NR; NR					
Radiolabel, Source, State, and Purity		NR; NR; Solid; NR					
Duration		Not Reported	Not Reported				
Standard Deviation Results		Not reported					
Results Details		Specific gravity 3.161-3.405; measured l	hydrostatically; 4 sa	amples containing 60-99% ferro-actinolite			
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabili	itv						
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-			
		(Method Objectivity)	6	tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	Low	Units not reported but expected to be g/cm3.			
Domain 3: Other							
	Metric 5:	Databases	High	Data is from a recognized, peer-reviewed data collection.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	ty Determi	nation	High				

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3647242 Table: 1 of 6

Study Citation:	Anonymous (1989	). NIOSH Manual of Analyt	ical Methods, (3rd Edition 3rd Supplement	nt). NIOSH(NIOSH):89-127.			
OECD Harmonized	Particle Size						
Template:							
HERO ID:	3647242						
			EXTRACTION				
Parameter		Data					
Aerodynamic Value		Not Reported					
CASRN and Test Material		12001-29-5; chrysotile					
Confidentiality, Type, and C	Guideline	None; Experimental; not repo	rted				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR					
Radiolabel, Source, State, a	and Purity	None; NR; fiber; NR					
Method Type, Particle, Dis	tribution, and Particle	Not Reported; Not Reported; Not Reported; Not Reported					
Size							
Geometric Standard Deviation		Not Reported					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		aspect ratio generally >10:1					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution Not Reported							
Additional Passage Details		Not Reported					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance			6				
	Metric 1.	Representativeness	High Data are measu	red or estimated for the subject chemical substance			

Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or other physical/chemical properties.
Domain 2: Test Relia	ability			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Continued on next page ...

### Page 231 of 522

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

HERO ID: 3647242 Table: 1 of 6

		continued from previous page		
Study Citation: OECD Harmonized Template:	Anonymous (1989). NIOSH Manual of Analy Particle Size	tical Methods, (3rd Edition 3rd Supplement).	NIOSH(NIOSH):89-127.	
HERO ID:	3647242			
		EVALUATION		
Domain	Metric	Rating	Comments	
<b>Overall Quali</b>	ty Determination	High		

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3647242 Table: 2 of 6

Study Citation: OECD Harmonized	Anonymous (1989 Particle Size	). NIOSH Manual of Analytical Metho	ods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.			
Template:							
HERO ID:	3647242						
			EXTRACTIO	N			
Parameter		Data					
Aerodynamic Value		Not Reported					
CASRN and Test Material		12001-28-4; crocidolite					
Confidentiality, Type, and C	Juideline	None; Experimental; not reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	None; NR; fiber; NR Notes: riebeckite					
Method Type, Particle, Dist	tribution, and Particle	Not Reported; Not Reported; Not Reported; Not Reported					
Size							
Geometric Standard Deviat	ion	Not Reported					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		aspect ratio generally >10:1					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
			FVAL HATIO				
Domain		Metric	Rating	Comments			
Domain 1: Substance		· · ·					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or			

				other physical element properties.
Domain 2: Test Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3647242 Table: 3 of 6

Study Citation: OECD Harmonized	Anonymous (1989 Particle Size	). NIOSH Manual of Analytical Met	thods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.		
HERO ID:	3647242	3647242				
			EXTRACTIO	N		
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		12172-73-5; cummingtonite-grunerite				
Confidentiality, Type, and C	Guideline	None; Experimental; not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	None; NR; fiber; NR Notes: amosite				
Method Type, Particle, Dist	tribution, and Particle	Not Reported; Not Reported; Not Repo	orted; Not Reported			
Size						
Geometric Standard Deviat	ion	Not Reported				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		aspect ratio generally >10:1				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				
Domain		Matria	EVALUATIO	N Commonte		
Domain Domain 1: Substa		Metric	Kaung	Comments		
Domain 1: Substance	M - 1		TT' 1			
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	Hıgh	Measured data are consistent with the subject chemical substance structural features or other physical/chemical properties.		
Domain 2 <sup>.</sup> Test Reliabili	ity					

Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
		inclusion in a peer-reviewed/recognized database or other secondary source.
Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
Models	N/A	Rating of this factor is not applicable to this kind of information.
	Databases Models	Databases High Models N/A

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3647242 Table: 4 of 6

Study Citation: OECD Harmonized	Anonymous (1989 Particle Size	). NIOSH Manual of Analytical Methods	s, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.			
HERO ID:	3647242	3647242					
		E	EXTRACTIO	N			
Parameter		Data					
Aerodynamic Value		Not Reported					
CASRN and Test Material		17068-78-9; anthophyllite					
Confidentiality, Type, and C	Guideline	None; Experimental; not reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	None; NR; fiber; NR					
Method Type, Particle, Dis	tribution, and Particle	Not Reported; Not Reported; Not Reported					
Size Geometric Standard Deviat	ion	Not Papartad					
Mean	1011	Not Reported					
Standard Daviation Maan		Not Reported					
Demarks		Not Reported					
Dage Number		Not Reported					
Passage		Not Reported					
Maan Siza Dassage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
Additional Lassage Details		Not Reported					
		I	EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or other physical/chemical properties.			
Domain Domain 1: Substance	Metric 1: Metric 2:	Metric Representativeness Appropriateness	EVALUATIO Rating High High	N Comments Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features other physical/chemical properties.			

Domain 2: Test Reliabi	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3647242 Table: 5 of 6

Study Citation: OECD Harmonized	Anonymous (1989 Particle Size	). NIOSH Manual of Analytical Method	s, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.		
Template: HERO ID:	3647242					
	5047242			<b>.</b> ,		
Damanuatan		Data	EXTRACTIO	N		
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		14567-73-8; tremolite				
Confidentiality, Type, and G	luideline	None; Experimental; not reported				
Solvent, Reactivity, Storage,	, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, an	nd Purity	None; NR; fiber; NR				
Method Type, Particle, Distr	ribution, and Particle	Not Reported; Not Reported; Not Reported; Not Reported				
Size						
Geometric Standard Deviati	on	Not Reported				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		aspect ratio generally <10:1				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				
		]	EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or		

Domain 2: Test Reliability Metric 3:	Reliability/Unbiased		
Metric 3:	Reliability/Unbiased		
	(Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other			
Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3647242 Table: 6 of 6

Study Citation: OECD Harmonized	Anonymous (1989) Particle Size	). NIOSH Manual of Analytical Methods,	, (3rd Edition	n 3rd Supplement). NIOSH(NIOSH):89-127.
Template:	Template:HERO ID:3647242			
HERO ID:				
		E	XTRACTIO	DN
Parameter		Data		
Aerodynamic Value		Not Reported		
CASRN and Test Material		13768-00-8; actinolite		
Confidentiality, Type, and C	Guideline	None; Experimental; not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	None; NR; fiber; NR		
Method Type, Particle, Dist	tribution, and Particle	Not Reported; Not Reported; Not Reported;	Not Reported	
Size		N ( D ( )		
Geometric Standard Deviat	ion	Not Reported		
Mean		Not Reported		
Standard Deviation Mean		Not Reported		
Remarks		aspect ratio generally <10:1		
Page Number		Not Reported		
Passage		Not Reported		
Mean Size Passage		Not Reported		
Distribution		Not Reported		
Additional Passage Details		Not Reported		
			VALUATIO	NI .
Domain		L. Matria	Poting	Comments
Domain 1: Substance		Meure	Katilig	Comments
Domain 1: Substance	Matria 1.	Dennagentativeness	High	Determined an estimated for the architecture industrial substance
	Metric 1:	A manufacture and	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or other physical/chemical properties.

				other physical element properties.
Domain 2. Test Relia	bility			
Domain 2. Test Kena	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Study Citation:	Bailey, K. F., Kels	e, J., Wylie, A. G., Lee, R. J. (2006). The asbestiform and prismatic mineral growth habit and their relationship to cancer studies: A				
OECD Harmonized	Particle Size					
HERO ID:	785518					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		NR - NR				
CASRN and Test Material		14567-73-8; tremolite				
Confidentiality, Type, and	Guideline	none; Experimental; not specified				
Solvent, Reactivity, Storage, and Stability		NR; NR; NR				
Radiolabel, Source, State,	and Purity	NR; NR; NR Notes: NR				
Method Type, Particle, Dis	tribution, and Particle	Not Reported; other; other; Not Reported				
Size Geometric Standard Davia	tion	ND ND ND				
Moon	uon					
Standard Deviation Mean						
Pamarks		NK				
Remarks		$0.7\%$ of inders exceeded a 0.01 $\mu$ m width. Fifty-three percent of all inders were < 1.0 $\mu$ min length while 6% exceeded 5 $\mu$ m in length				
Page Number		ND ND				
I assage Mean Size Dessage		Not Papartad				
Distribution		NR _ NR				
Additional Dassage Dataila						
Additional Passage Details		INK				

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are reported for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>		Medium		
Continued on next page				

Page 238 of 522

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

HERO ID: 785518 Table: 1 of 2

continued from previous page				
Study Citation:	Bailey, K. F., Kelse, J., Wylie, A. G., Lee, R. J. (200 pictorial presentation.	6). The asbestiform and prism	natic mineral growth habit and their relationship to cancer studies: A	
<b>OECD Harmonized</b>	Particle Size			
Template:				
HERO ID:	785518			
		EVALUATION		
Domain	Metric	Rating	Comments	

\* Related References: Primary source not available at time of extraction: Langer, A. M., and Nolan, R. P.: Letter to the R. T. Vanderbilt Company, Inc., (March 12, 1990).

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 785518 Table: 2 of 2

Study Citation:	Bailey, K. F., Kels pictorial presentati	e, J., Wylie, A. G., Lee, R. J. (2006). The asbestiform and prismatic mineral growth habit and their relationship to cancer studies: A on.				
OECD Harmonized	Particle Size					
Template:	705510					
HERO ID:	/85518					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		NR - NR				
CASRN and Test Material		77536-68-6; winchite				
Confidentiality, Type, and C	Juideline	none; Experimental; not specified				
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR				
Radiolabel, Source, State, and Purity		NR; NR; NR Notes: NR				
Method Type, Particle, Dist	ribution, and Particle	Not Reported; other; other; Not Reported				
Size		חזג חזג				
Geometric Standard Deviati	ion					
Mean		NR - NR				
Standard Deviation Mean		NR				
Remarks		Range of diameters: 0.1-0.2 $\mu$ m, length: 1-70 $\mu$ m (62%>5 $\mu$ m), aspect ratio: 3:1-100:1; fibers >0.45 $\mu$ m in width and >5 $\mu$ m in length, collected on air filters, 96% had aspect ratios >10:1, 67% had 20:1 or greater aspect ratios and 10% were 50:1 or greater				
Page Number		Not Reported				
Passage		NR - NR				
Mean Size Passage		Not Reported				
Distribution		NR - NR				
Additional Passage Details		NR				

		EVALUATION	
Domain	Metric	Rating	Comments
Domain 1: Substance			
Metric 1:	Representativeness	High	Data are reported for the subject chemical substance.
Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliability			
Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other			
Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

## **Overall Quality Determination**

Medium

\* Related References: Primary HERO ID 29964 - McDonald, J.C., McDonald, A. D., Armstrong, B., and Sebastien, P.: Cohort Study of Mortality of Vermiculite Miners Exposed to Tremolite. British Journal of Industrial Medicine, 43: 436-444, (1986).

Study Citation:	Burdett, G. J., Rood, A. P. (1983). Membrane-filter, direct-transfer technique for the analysis of asbestos fibers or other inorganic particles by transmission					
OECD Harmonized	electron microscop Particle Size	electron microscopy. Environmental Science and Technology 17(11):643-648. Particle Size				
Template:						
HERO ID:	55					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		0.04 um - 0.06 um				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and	Guideline	None; Experimental; Membrane filter with TEM quantification				
Solvent, Reactivity, Storage	e, and Stability	airborne samples collected on a membrane filter were prepared using DMF, glacial acetic acid and water; NR; NR; NR				
Radiolabel, Source, State, and Purity		NR; airborne samples; solid; NR Notes: NR				
Method Type, Particle, Dis	tribution, and Particle	determination of fibre length and diameter distributions; primary particle; counted distribution; Not Reported				
Geometric Standard Deviat	tion	NR - NR				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Mean fiber size = 0.04 and 0.06 um width and 1.07 and 1.17 um length from filtered suspensions of ultrasonically treated UICC chrysotile and				
		airborne samples from factories, respectively				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				

			EVALUATIO	Ν
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

#### Continued on next page ...

Page 241 of 522

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE
April 2024

Particle Size

continued from previous page					
Study Citation:	Burdett, G. J., Rood, A. P. (1983). Membrane-filter, direct-transfer technique for the analysis of asbestos fibers or other inorganic particles by transmission electron microscopy. Environmental Science and Technology 17(11):643-648.				
<b>OECD Harmonized</b>	Particle Size	Particle Size			
Template:					
HERO ID:	55				
		EVALUATION			
Domain	Metric	Rating	Comments		
<b>Overall Quali</b>	Overall Quality Determination High				

Study Citation:	Burdett, G. J., Rood, A. P. (1983). Membrane-filter, direct-transfer technique for the analysis of asbestos fibers or other inorganic particles by transmission					
<b>OECD</b> Harmonized	Particle Size	by. Environmental Science and Techno	1000000000000000000000000000000000000	-048.		
Template:						
HERO ID:	55					
			EXTRACTIO	DN		
Parameter		Data				
		0.04				
Aerodynamic Value		0.24 um -				
CASKN and Test Material	C: 4-1:	121/2-/3-5; Amosite	A TEM	41-11		
Confidentiality, Type, and	Guideline	None; Experimental; Memorane litter wi	in TEM quantifica	uion and using DME closicle sections id and usetam ND, ND, ND		
Dedicate and Second State	e, and Stability	ND, sith and seven law solid. ND Natar	ND	ared using Divir, gracial acelic acid and water, Ivk, Ivk, Ivk		
Mathad Tuna Dartiala Di-	and Furily	determination of fibre length and discuss	INK	imary partialay aguntad distribution. Not Daparted		
Size	stribution, and Particle	determination of note length and dramen	er distributions; pr	mary particle; counted distribution; Not Reported		
Geometric Standard Devia	tion	NR - NR				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Mean fiber size = $0.24$ um width and $3.0$	0 um length from	filtered suspensions of ultrasonically treated UICC amosite		
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details	:	Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabil	lity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
		(Method Objectivity)	8**	tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 2: Other						
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources		

# **Overall Quality Determination**

Metric 6:

Models

N/A

High

Rating of this factor is not applicable to this kind of information.

Study Citation:	Candela, P. A., Crummett, C. D., Earnest, D. J., Frank, M. R., Wylie, A. G. (2007). Low-pressure decomposition of chrysotile as a function of time and temperature. American Mineralogist 92(10):1704-1713.					
<b>OECD Harmonized</b>	Particle Size					
Template:	2502(10					
HERO ID:	3582618					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		Average width: 0.17 μm -				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and Guideline		None; Experimental; NR				
Solvent, Reactivity, Storage, and Stability		NR; NR; NR				
Radiolabel, Source, State, and Purity		NA; Jeffrey Mine, Asbestos, Quebec, Canada; Solid; fibers and fiber bundles; 96% Chrysotile Notes: Jeffrey Plastibest 20 (CP85), referred to as Jeffrey CP				
Method Type, Particle, Dis Size	tribution, and Particle	microscopic examination; aggregate; other; Not Reported				
Geometric Standard Deviation		Not Reported				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Mean length: 21 µm				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				

EVALUATION							
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			

Continued on next page ...

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

		continued from previous page					
Study Citation:	Candela, P. A., Crummett, C. D., Earnest, D. J	I., Frank, M. R., Wylie, A. G. (2007). L	ow-pressure decomposition of chrysotile as a function of time and				
OECD Harmonized	Particle Size	04-1713.					
Template:							
HERO ID:	3582618						
EVALUATION							
Domain	Metric	Rating	Comments				
<b>Overall Quali</b>	ty Determination	High					

\* Related References: Source cited (not available at time of extraction; HERO ID 3658760 pdf missing pages): Campbell, W.J., Huggins, C.W., and Wylie, A.G. (1980) Chemical and physical characterization of amosite, chrysotile, crocidolite, and nonfibrous tremolite for oral ingestion studies by the National Institute of Environmental HealthSciences, U.S. Bureau of Mines Report of Investigations, RI8452, 63 p.

Page 245 of 522

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

Study Citation:	Candela, P. A., Crummett, C. D., Earnest, D. J., Frank, M. R., Wylie, A. G. (2007). Low-pressure decomposition of chrysotile as a function of time and temperature. American Minarabarist 02(10):1704-1713					
OECD Harmonized	Particle Size					
Template:						
HERO ID:	3582618					
			EXTRACTIO	N		
Parameter		Data				
Aerodynamic Value		Average width: 0.07 um -				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; NR				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NA; New Idria, California; Solid; fibers and fiber bundles; 96% Chrysotile				
Method Type, Particle, Distribution, and Particle		microscopic examination; aggregate; other; Not Reported				
Size						
Geometric Standard Deviation		Not Reported				
Mean Standard Deviation Maan		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Ivicali iciigili. 2.1 µili Nat Damartad				
Page Number		Not Reported				
Passage Maan Siza Dassaga		Not Reported				
Distribution		Not Reported				
Additional Passage Datails		Not Reported				
Additional Lassage Details		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		

	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Relia	bility					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			
Continued on next page						

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

HERO ID: 3582618 Table: 2 of 2

	continued from previous page	
Candela, P. A., Crummett, C. D., Earnest, D. temperature. American Mineralogist 92(10):1	J., Frank, M. R., Wylie, A. G. (2007). Low- 1704-1713.	pressure decomposition of chrysotile as a function of time and
Particle Size		
3582618		
	EVALUATION	
Metric	Rating	Comments
:	Candela, P. A., Crummett, C. D., Earnest, D. temperature. American Mineralogist 92(10): Particle Size 3582618 Metric	continued from previous page         Candela, P. A., Crummett, C. D., Earnest, D. J., Frank, M. R., Wylie, A. G. (2007). Low-temperature. American Mineralogist 92(10):1704-1713.         Particle Size         3582618         EVALUATION         Metric       Rating

\* Related References: Source cited (not available at time of extraction; HERO ID 3658760 pdf missing pages): Campbell, W.J., Huggins, C.W., and Wylie, A.G. (1980) Chemical and physical characterization of amosite, chrysotile, crocidolite, and nonfibrous tremolite for oral ingestion studies by the National Institute of Environmental Health Sciences, U.S. Bureau of Mines Report of Investigations, RI8452, 63 p.

Page 247 of 522

Study Citation:	Chatfield, E. J. (1999). Correlated measurements of airborne asbestos-containing particles and surface dust. American society for testing and materials						
OECD Harmonized	special technical publication 1342:378-402. Particle Size						
Template:							
HERO ID:	6892000						
		EXTRACTION					
Parameter		Data					
Aerodynamic Value		Not Reported					
CASRN and Test Material		12001-29-5; chrysotile					
Confidentiality, Type, and Guideline		None; Experimental; Transmission electron microscope analysis of airborne dust samples from an elutriator. ISO 10312 Ambient air — Determina- tion of asbestos fibres — Direct transfer transmission electron microscopy method and ASTM D5755-95 Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations					
Solvent, Reactivity, Storage, and Stability		NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; Ceiling tile, floor tile, acoustic surfacing material, fireproofing, Pipe elbow cement; Solid; NR Notes: particles from chrysotile-containing materials					
Method Type, Particle, Dis Size	tribution, and Particle	microscopic examination; primary particle; other; Not Reported					
Geometric Standard Deviat	tion	Not Reported					
Mean		0.5 - 34.06 µm					
Standard Deviation Mean		NR					
Remarks		Not Reported					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					

EVALUATION							
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabi	lity Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard; how- ever, there is some uncertainty if the data reported is for asbestos or the dust particle.			

Domain 3: Other

Continued on next page ...

os		PUBLIC REI	LEASE DRAFT – DO April 2024 Particle Size	NOT CITE OR QUOTE HERO ID: 6892000 Table:
			continued from pre	vious page
Study Citation: OECD Harmonized Template:	Chatfield, E. J special technic Particle Size	7. (1999). Correlated measureme cal publication 1342:378-402.	nts of airborne asbestos-c	ontaining particles and surface dust. American society for testing and materials
HERO ID:	6892000			
			EVALUATIO	N
Domain		Metric	Rating	Comments
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quali	ty Determ	ination	High	

Study Citation:	Cluff, D. L., Patitsa	as, A. J. (1992). Size Characterization o	of Asbestos Fibe	rs by Means of Electrostatic Alignment and Light-Scattering Techniques. Aerosol
OECD Harmonized	Particle Size	lology 17(3):186-198.		
Template:				
HERO ID:	3096394			
			EXTRACTIO	NN N
Parameter		Data		
Aerodynamic Value		0.16 (0 min centrifugation), 0.15 (5 min c	entrifugation) 01	12 (15 min centrifugation) and 0 11 µm (20 min centrifugation) -
CASRN and Test Material		12001-28-4; Crocidolite	entinugation), or	
Confidentiality, Type, and C	Guideline	None; Experimental; NA		
Solvent, Reactivity, Storage	e, and Stability	Light mineral oil; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NA; Union Internationale Contre le Canco	er; Solid; NR Note	es: Solutions sonicated for ~60s and centrifuged for 0, 5, 15, or 20 min, respectively
Method Type, Particle, Dis	tribution, and Particle	Laser scattering/diffraction; aggregate; ot	her; Not Reported	l
Geometric Standard Deviat	ion	Not Reported		
Mean		Not Reported		
Standard Deviation Mean		Not Reported		
Remarks		Not Reported		
Page Number		Not Reported		
Passage		Not Reported		
Mean Size Passage		Not Reported		
Distribution		Not Reported		
Additional Passage Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)	8	tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
				- · · · · · ·
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determina	ation	High	
	v -	Cont	inuad on novt .	nga

Page 250 of 522

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE	
Ame: 1 2024	

April 2024

Particle Size

HERO ID: 3096394 Table: 1 of 1

continued from previous page								
Study Citation:	Cluff, D. L., Patitsas, A. J. (1992). Size Characterization of Asbestos Fibers by Means of Electrostatic Alignment and Light-Scattering Techniques. Aerosol							
OECD Harmonized	Science and Technology 17(3):186-198. Particle Size							
Template: HERO ID:	3096394							
		EVALUATION						
Domain	Metric	Rating	Comments					

Study Citation:	Duncan, K. E., Cook, P. M., Gavett, S. H., Dailey, L. A., Mahoney, R. K., Ghio, A. J., Roggli, V. L., Devlin, R. B. (2014). In vitro determinants of asbestos					
OECD Harmonized	tiber toxicity: effect on the relative toxicity of Libby amphibole in primary human airway epithelial cells. Particle and Fibre Toxicology 11(2):2. Particle Size					
Template:						
HERO ID:	2342642					
EXTRACTION						
Parameter		Data				
Aerodynamic Value		Total particle mean width $-0.44 \pm 0.01.0.43 \pm 0.01$ for RTI and LUCC amosite respectively -				
CASRN and Test Material		12172-73-5: Amosite				
Confidentiality Type and Guideline		None: Experimental: SEM and TEM analysis				
Solvent, Reactivity, Storage, and Stability		NR: NR: NR				
Radiolabel, Source, State, and Purity		NR: Research Triangle Institute (RTI) amosite and Union for International Cancer Control amosite: NR: NR Notes: NR				
Method Type, Particle, Distribution, and Particle		microscopic examination; primary particle; counted distribution; other				
Size						
Geometric Standard Deviation		Not Reported				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Total particle mean length = $6.4 \pm 0.62.1 \pm 0.3$ and mean aspect ratio = $16.9 \pm 1.6$ , $5.6 \pm 0.6$ for RTI and UICC amosite, respectively				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				

EVALUATION							
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)	TT: 1	towards a particular product of outcome.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Quality Determination</b>			High				
Continued on next page							

Page 252 of 522
		April 2024			
OS		Particle Size	HERO ID: 2342642 Table: 1		
		continued from previous page			
Study Citation:	Duncan, K. E., Cook, P. M., Gavett, S. H., Dailey, L. A., Mahoney, R. K., Ghio, A. J., Roggli, V. L., Devlin, R. B. (2014). In vitro determinants of asbestos fiber toxicity: effect on the relative toxicity of Libby amphibole in primary human airway epithelial cells. Particle and Fibre Toxicology 11(2):2.				
<b>OECD Harmonized</b>	Particle Size				
Template:					
HERO ID:	2342642				
		EVALUATION			
Domain	Metric	Rating	Comments		

**PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE** 

### Page 253 of 522

Study Citation: OECD Harmonized	Duncan, K. E., Co fiber toxicity: effect Particle Size	ook, P. M., Gavett, S. H., Dailey, L. A., Mahoney, R. K., Ghio, A. J., Roggli, V. L., Devlin, R. B. (2014). In vitro determinants of asbestos ect on the relative toxicity of Libby amphibole in primary human airway epithelial cells. Particle and Fibre Toxicology 11(2):2.					
Template: HERO ID:	2342642						
IILKO ID:	2312012			N			
Parameter		Data	EATRACIIO	IN			
		Dum					
Aerodynamic Value		Total particle mean width = $0.36 \pm 0.02$	um for LA (2000) a	and $0.36\pm0.01$ um for LA (2007) -			
CASRN and Test Material		1318-09-8; Libby amosite					
Confidentiality, Type, and	Guideline	None; Experimental; SEM and TEM ana	lysis				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; Libby Montana; NR; NR Notes: san	npled 2000 and 20	07			
Method Type, Particle, Dis	tribution, and Particle	microscopic examination; primary partic	ele; counted distribu	ution; other			
Size Geometric Standard Deviat	tion	Not Perperted					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		Total particle mean length = $3.7$ and $2.3$	um + 0.2 $um$ and r	mean aspect ratio = $12.8 \pm 0.6.84 \pm 0.7$ for LA (2000) and LA (2007)			
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2. Test Reliabil	ity						
Domain 2. Test Kelldon	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	Mettre 5.	(Method Objectivity)	Weardin	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are			
	Matria C.	Madala	NT/ A	peer-reviewed by experts in the field, are broadly available to the public for review.			
	Metric 0:	WIOdels	IN/A	kaung of this factor is not applicable to this kind of information.			

# **Overall Quality Determination**

High

Study Citation: OECD Harmonized	Gaze, R. (1965). T Particle Size	The Physical and Molecular Structure of	Asbestos. Annals o	f the New York Academy of Sciences 132:23-30.		
HERO ID:	3646977					
			EXTRACTION			
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and	Guideline	none; Not specified; not specified				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR Notes: white asbestos;	chemical formula 3M	IgO 2SiO2 2H2O		
Method Type, Particle, Dis	stribution, and Particle	other; other; Not Reported; Not Reported				
Size	4°	Not Domosto d				
Geometric Standard Devia	tion	Not Reported				
Mean Standard Deviation Man		Not Reported				
Standard Deviation Mean		Approximate diameter of smallest fiberal O	01 mionon			
Remarks		Approximate diameter of smallest libers: 0				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				
Auditional I assage Details		Not Reported				
			EVALUATION			
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	Medium	Details have been omitted.		
Domain 2: Test Reliabil	lity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	Low	towards a particular product or outcome. The analytical method is unknown and there is no indication that a reliable method was used.		

Domain 3: Other

0			•		
		Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
		Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
Jomain 3	: Other				

# **Overall Quality Determination**

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3646977 Table: 2 of 3

Study Citation: OECD Harmonized	Gaze, R. (1965). T Particle Size	Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30. Particle Size				
Template:	3646977					
	50+0977					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		12001-29-5; Crocidolite				
Confidentiality, Type, and	Guideline	none; Not specified; not specified				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR Notes: blue asbestos; chemical formula Na2O 3FeO Fe2O3 8SiO2 H2O				
Method Type, Particle, Dis	stribution, and Particle	other; other; Not Reported; Not Reported				
Size Geometric Standard Deviat	tion	Not Reported				
Mean	lion	Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Approximate diameter of smallest fibers: 0.08 micron				
Page Number		Not Reported				
Passage Not Reported		Not Reported				
Mean Size Passage	Jean Size Passage Not Reported					
Distribution		Not Reported				
Additional Passage Details		Not Reported				

			EVALUATION		
Domain	Domain Metric		Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	Medium	Details have been omitted.	
Domain 2: Test Relia	bility				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome	
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Quality Determination</b>			NEED TO FIX		

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3646977 Table: 3 of 3

Study Citation: OECD Harmonized	Gaze, R. (1965). T Particle Size	he Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30.		
Template:				
HERO ID:	3646977			
		EXTRACTION		
Parameter		Data		
Aerodynamic Value		Not Reported		
CASRN and Test Material		12001-29-5; amosite		
Confidentiality, Type, and C	Guideline	none; Not specified; not specified		
Solvent, Reactivity, Storage, and Stability		NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR Notes: chemical formula 1.5MgO 5.5FeO 8SiO2 H2O		
Method Type, Particle, Dist	tribution, and Particle	other; other; Not Reported; Not Reported		
Size				
Geometric Standard Deviati	ion	Not Reported		
Mean		Not Reported		
Standard Deviation Mean		Not Reported		
Remarks		Approximate diameter of smallest fibers: 0.1 micron		
Page Number		Not Reported		
Passage Not Reported		Not Reported		
Mean Size Passage Not Reported		Not Reported		
Distribution		Not Reported		
Additional Passage Details		Not Reported		

			EVALUATION		
Domain		Metric	Rating	Comments	
Domain 1: Substance	e				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	Medium	Details have been omitted.	
Domain 2: Test Relia	ability				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome	
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was	
				used	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
	lity Dotorm	ination	νέξη το είν		
Overall Qua	my Determ	manon	NEED IUTIA		

Study Citation: OECD Harmonized	Gentry, J. W. (1987). SURVEY OF RECENT MEASUREMENTS WITH ASBESTOS FIBERS. Journal of Aerosol Science 18(5):47-486. Particle Size				
HERO ID:	3580641				
		EXTRACTION			
Parameter		Data			
Aerodynamic Value		Not Reported			
CASRN and Test Material		1332-21-4: Asbestos			
Confidentiality, Type, and	Guideline	None: Experimental: Non-guideline: filtration followed by TEM analysis			
Solvent, Reactivity, Storage	e, and Stability	aqueous suspensions; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR Notes: NA			
Method Type, Particle, Dis	tribution, and Particle	microscopic examination; primary particle; Not Reported; Not Reported			
Size					
Geometric Standard Deviat	tion	Not Reported			
Mean Standard Deviation Man		Not Reported			
Standard Deviation Mean		Not Reported			
Remarks		Not Reported			
Page Number		Not Reported			
Passage		Not Reported			
Distribution		Not Reported			
Additional Passage Details		Not Reported Mean diameter 0.02-0.05 μm; aspect ratio of 10-30.			

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	Low	Data are measured or estimated for the subject chemical substance; however, many details about the test substance are not reported.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabi	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Continued on next page ...

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

HERO ID: 3580641 Table: 1 of 2

		continued from previous page				
Study Citation: OECD Harmonized	Gentry, J. W. (1987). SURVEY OF RECENT MEASUREMENTS WITH ASBESTOS FIBERS. Journal of Aerosol Science 18(5):47-486. Particle Size					
Template:						
HERO ID:	3580641					
		EVALUATION				
Domain	Metric	Rating	Comments			
<b>Overall Quali</b>	Overall Quality Determination Medium					

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3580641 Table: 2 of 2

Study Citation: OECD Harmonized	Gentry, J. W. (1987) Particle Size	7). SURVEY OF RECENT MEA	ASUREMENTS WITH ASE	BESTOS FIBERS. Journal of Aerosol Science 18(5):47-486.		
HERO ID:	3580641					
			EXTRACTION			
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		1332-21-4; Asbestos				
Confidentiality, Type, and Guideline		None; Experimental; Non-guideline; Spumy Vibrating Bed Generator followed by counting using Royco 203 or Climet 208) or with a condensation nuclei counter TSI 3020; X-ray diffraction and elemental analysis.				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR Notes: NA				
Method Type, Particle, Dis	stribution, and Particle	microscopic examination; primary particle; Not Reported; Not Reported				
Size Geometric Standard Deviat	tion	Not Reported				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Not Reported				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Mean diameter 0.2-0.4 µm, aspect ratio of 5-15 (particles from vibrating beds have 1000 times the mass of samples from nebulized suspensions)				
			EVALUATION			
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	Low	Data are measured or estimated for the subject chemical substance; however, many details about the test substance are not reported.		
				-		

<b>Overall Qual</b>	ity Determ	ination	Medium	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
Domain 2: Test Reliab	ility			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
				details about the test substance are not reported.

Study Citation:	Huntington, J. C., I	Huntington, J. C., Ptasienski, J. J., Bunker, K. L., Strohmeier, B. R., Van Orden, D. R., Lee, R. J. (2008). A new method for fracturing mineral particles for					
<b>OECD Harmonized</b>	Particle Size	SEM analysis. Periodico di Milieralogia 77(2):43-30.					
Template:							
HERO ID:	3583340						
		EXTRACTION					
Parameter		Data					
Aerodynamic Value		Not Reported					
CASRN and Test Material		12001-29-5; Chrysotile 1866 Standard Reference Material					
Confidentiality, Type, and G	Guideline	None; Experimental; None					
Solvent, Reactivity, Storage	, and Stability	Buehler Epoxicure Resin; NR; NR					
Radiolabel, Source, State, an	nd Purity	NA; National Institute of Standards and Technology; Solid; NR Notes: Samples prepared by vacuum impregnation in epoxy					
Method Type, Particle, Dist	ribution, and Particle	other; primary particle; counted distribution; Not Reported					
Size	ion.	Not Demonstrad					
Moon	1011	Not Reported					
Nicall Standard Daviation Maan		Not Reported					
Bemerika		Not Reported					
Remarks		Mean diameter = 0.06 um (major chord) and 0.05 um (minor chord) measured by SE FESEM					
Page Number		Not Reported					
Passage		Not Reported					
Niedii Size Passage		Not Reported					
Additional Danage Dataile		Not Reported					
Additional Passage Details		Not keponed					

	EVALUATION					
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	lity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>		High				
	Continued on next page					

Page 261 of 522

PUBLIC RELEASE DRAFT – DO NOT CITE OR Q	QUOTE
4 pril 2024	

Particle Size

HERO ID: 3583340 Table: 1 of 3

		continued from previous page	
Study Citation:	Huntington, J. C., Ptasienski, J. J., Bunker, K. cross-sectional FESEM analysis. Periodico di	L., Strohmeier, B. R., Van Orden, D. R., Lee Mineralogia 77(2):43-50.	, R. J. (2008). A new method for fracturing mineral particles for
<b>OECD Harmonized</b>	Particle Size		
Template:			
HERO ID:	3583340		
		EVALUATION	
Domain	Metric	Rating	Comments

April 2024

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

Study Citation:	Huntington, J. C., l	Huntington, J. C., Ptasienski, J. J., Bunker, K. L., Strohmeier, B. R., Van Orden, D. R., Lee, R. J. (2008). A new method for fracturing mineral particles for						
	cross-sectional FE	cross-sectional FESEM analysis. Periodico di Mineralogia 77(2):43-50.						
OECD Harmonized	Particle Size							
Template:								
HERO ID:	3583340	3583340						
			EXTRACTIO	N				
Parameter		Data						
T ur uniceer		Dum						
Aerodynamic Value		Not Reported						
CASRN and Test Material		12001-28-4; Chrysotile 1866 Standard	Reference Material					
Confidentiality, Type, and C	Juideline	None; Experimental; None						
Solvent, Reactivity, Storage	, and Stability	Buehler Epoxicure Resin; NR; NR; NR						
Radiolabel, Source, State, a	nd Purity	NA; National Institute of Standards and Technology; Solid; NR Notes: Samples prepared by vacuum impregnation in epoxy						
Method Type, Particle, Dist	ribution, and Particle	other; primary particle; counted distribution; Not Reported						
Size		Not Domostod						
Geometric Standard Deviati	ion							
Mean								
Standard Deviation Mean								
Remarks		Mean diameter = 0.09 um (major chord) and 0.07 um (minor chord) measured by SE FESEM						
Page Number		Not Reported						
Passage		Not Reported						
Mean Size Passage		Not Reported						
Distribution		Not Reported						
Additional Passage Details		Not Reported						
			EVALUATIO	N				
Domain		Metric	Rating	Comments				
Domain 1: Substance								
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.				
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.				
		** *		- 11				

<b>Overall Quality Determination</b>			High	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
Domain 2: Test Reli	ability			

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

Study Citation:	Huntington, J. C., I	tasienski, J. J., Bunker, K. L., Stroh	meier, B. R., Van Orden, D. R.	Lee, R. J. (2008). A new method for fracturing mineral particles for			
OECD Harmonized	cross-sectional FESEM analysis. Periodico di Mineralogia 77(2):43-50. Particle Size						
Template: HERO ID:	3583340						
			EXTRACTION				
Parameter		Data					
Aerodynamic Value		Not Reported					
CASRN and Test Material		12172-73-5; Chrysotile 1866 Standard	Reference Material				
Confidentiality, Type, and G	Buideline	None; Experimental; None					
Solvent, Reactivity, Storage	, and Stability	Buehler Epoxicure Resin; NR; NR					
Radiolabel, Source, State, and	nd Purity	NA; National Institute of Standards and Technology; Solid; NR Notes: Samples prepared by vacuum impregnation in epoxy					
Method Type, Particle, Dist	ribution, and Particle	other; primary particle; counted distribution; Not Reported					
Size		Not Departed					
Meen	1011	Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		Mean diameter $= 0.23 \text{ µm}$ (major chor	d) and 0.15 um (minor chord) mea	ured by SE FESEM			
Page Number		Not Reported	a) and 0.15 and (minor chord) mea				
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
			EVALUATION				
Domain		Metric	Rating	Comments			

Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qual</b>	ity Determ	ination	High	

-

Study Citation:	Keane, M. J., Stephens, J. W., Zhong, B. Z., Miller, W. E., Ong, T. M., Wallace, W. E. (1999). A study of the effect of chrysotile fiber surf on genotoxicity in vitro. Journal of Toxicology and Environmental Health, Part A: Current Issues 57(8):529-541.					
OECD Harmonized	Particle Size					
Template:						
HERO ID:	3080916					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		not reported - not reported				
CASRN and Test Material		12001-29-5; chrysotile asbestos				
Confidentiality, Type, and	Guideline	none; Not Reported; non-guideline: fiber length measurements via SEM				
Solvent, Reactivity, Storage	e, and Stability	deionized H2O (Millipore); suspension filtered through 0.4 µm pore size polycarbonate filter; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; National Institute of Environmental Health Sciences; solid; NR Notes: Intermediate-length chrysotile				
Method Type, Particle, Dis	tribution, and Particle	microscopic examination; other; counted distribution; Not Reported				
Size		not reported and reported not reported				
Geometric Standard Devia	tion	not reported - not reported not reported				
Mean		ca_lower Untreated fibers: size range $<3 \mu m$ count frequency: ca. 275; size range 3-10 $\mu m$ count frequency: ca. 205; size range $>10 \mu m$ count frequency: ca. 25; treated fibers: size range $<3 \mu m$ count frequency: ca. 340; size range 3-10 $\mu m$ count frequency: ca. 175; size range $>10 \mu m$ count frequency: ca. 15 - not reported				
Standard Deviation Mean		not reported				
Remarks		500 fibers measured for each sample (unmodified and acid treated); on average untreated fibers were 25% longer than treated fibers				
Page Number		Not Reported				
Passage		not reported - not reported				
Mean Size Passage		Not Reported				
Distribution		not reported - not reported				
Additional Passage Details		not reported				

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	36.1.4	(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
		Conti	nued on next p	page

Page 265 of 522

	PUBLIC R	ELEASE DRAFT – DO NOT CITE O	R QUOTE		
		April 2024			
bestos		Particle Size	HERO ID: 3080916 Table	: 1 of 1	
		continued from previous page		_	
Study Citation:	Study Citation: Keane, M. J., Stephens, J. W., Zhong, B. Z., Miller, W. E., Ong, T. M., Wallace, W. E. (1999). A study of the effect of chrysotile fiber surface composition on genotoxicity in vitro. Journal of Toxicology and Environmental Health. Part A: Current Issues 57(8):529-541.				
OECD Harmonized	Particle Size				
Template:					
HERO ID:	3080916				
		EVALUATION		-	
Domain	Metric	Rating	Comments	_	
<b>Overall Quali</b>	ty Determination	High		_	

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3084215 Table: 1 of 4

Study Citation: OECD Harmonized	Le Bouffant, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33. Particle Size						
HERO ID:	3084215						
			EXTRACTIO	N			
Parameter		Data					
Aerodynamic Value		$< 1.2 \mu{ m m}$					
CASRN and Test Material		12172-73-5; amosite					
Confidentiality, Type, and C	Juideline	None; Experimental; Scanning electron m	icroscope (SEM)				
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR					
Method Type, Particle, Dist	ribution, and Particle	microscopic examination; primary particle	e; other; Not Repo	rted			
Size Geometric Standard Deviati	ion	Not Reported					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		diameter range = $<0.10$ to 1.2 $\mu$ m (reported in citation HERO ID 3615279)					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
			EVALUATION	- ۲			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabili	ty						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	Matria 4.	(Method Objectivity)	Hick	towards a particular product or outcome.			
	Metric 4:	Renability/Analytical Method	High	Data are obtained by accepted standard analytical methods.			
Domain 3: Other							
Domain 5: Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			

# **Overall Quality Determination**

Metric 6:

Models

Continued on next page ...

N/A

High

Rating of this factor is not applicable to this kind of information.

Page 267 of 522

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

## April 2024

Particle Size

HERO ID: 3084215 Table: 1 of 4

		continued from previous page					
Study Citation:	Le Bouffant, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33.						
OECD Harmonized Template:	Particle Size						
HERO ID:	3084215						
		EVALUATION					
Domain	Metric	Rating	Comments				

\* Related References: HERO ID 3615279 "Physical and chemical characteristics of UICC reference samples"

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3084215 Table: 2 of 4

Study Citation: OECD Harmonized	Le Bouffant, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33. Particle Size						
HERO ID:	3084215						
			EXTRACTIO	N			
Parameter		Data					
Aerodynamic Value		$<1.0 \ \mu m$					
CASRN and Test Material	G . I. I.	12001-28-4; crocidolite					
Confidentiality, Type, and	Guideline	None; Experimental; Scanning electron	n microscope (SEM)				
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR					
Kadiolabel, Source, State,	and Purity	NK; NK; NR; NR Notes: NK	-las athens Nat Dans				
Size	stribution, and Particle	microscopic examination; primary part	icle; other; Not Repo	ortea			
Geometric Standard Devia	tion	Not Reported					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		diameter range = $<0.10$ to 1.00 $\mu$ m (reported in citation HERO ID 3615279)					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance			0				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2. Test Reliabil	lity						
2 onium 2. Test Kelldon	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	mente 5.	(Method Objectivity)	Wieddulli	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.			
Domain 3: Other	Matria 5.	Detahagaa	High				
	wieuric 5:	Databases	пign	peer-reviewed by experts in the field, are broadly available to the public for review and			

 Metric 6:
 Models
 N/A
 Rating of this factor is not applicable to this kind of information.

 Overall Quality Determination
 High

\* Related References: HERO ID 3615279 "Physical and chemical characteristics of UICC reference samples"

use OR includes references to the original sources.

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3084215 Table: 3 of 4

Study Citation: OECD Harmonized	Le Bouffant, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33. Particle Size						
HERO ID:	3084215						
			EXTRACTIO	N			
Parameter		Data					
A gradunamia Valua		<0.8 µm					
CASRN and Test Material		$< 0.8 \mu \text{m}$ 12001-29-5: chrysotile					
Confidentiality Type and	Guideline	None: Experimental: Scanning electror	microscope (SFM)				
Solvent Reactivity Storage	e and Stability	NR· NR· NR	Thieroscope (SEM)				
Radiolabel Source State	and Purity	NR: NR: NR: NR Notes: Chrysotiles A	and B				
Method Type. Particle Dis	stribution, and Particle	microscopic examination: primary part	icle: other: Not Repo	orted			
Size		N ( D ( )	, F				
Meen	tion	Not Reported					
Mean Standard Deviation Mean		Not Reported					
Pemarks		Not Reported diameter range $= <0.10$ to 0.80 µm (reported in situation HERO ID 3615270)					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2. Test Reliabil	ity						
Domain 2. Test Kellauli	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	metric 5.	(Method Objectivity)	wicalulli	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.			
Domain 3: Other		D . 1					
	Metric 5:	Databases	Hıgh	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and			

\* Related References: HERO ID 3615279 "Physical and chemical characteristics of UICC reference samples"

use OR includes references to the original sources.

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3084215 Table: 4 of 4

Study Citation: OECD Harmonized	Le Bouffant, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33. Particle Size						
HERO ID:	3084215						
			EXTRACTIO	N			
Parameter		Data					
Aerodynamic Value		<1.4 µm					
CASRN and Test Material		77536-87-5; anthophyllite					
Confidentiality, Type, and	Guideline	None; Experimental; Scanning electron	microscope (SEM)				
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR					
Method Type, Particle, Dis	stribution, and Particle	microscopic examination; primary parti	cle; other; Not Repo	orted			
Geometric Standard Devia	tion	Not Reported					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		diameter range = $<0.10$ to 1.4 $\mu$ m (reported in citation HERO ID 3615279)					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
				N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Tost D-1:-1:1	:						
Domain 2: Test Kellabil	Motrio 2:	Paliability/Upbiczad	Madine	There is no indication that the methodology for my during the information and 1'			
	wietric 5:	(Mathad Objectivity)	Mealum	I nere is no indication that the methodology for producing the information was blased towards a particular product or outcome.			
	Metric 4.	Reliability/Analytical Method	High	Data are obtained by accented standard analytical methods			
	тисине т.	Remainly// mary tear wiethou	Ingli	Data are ostanica of accepted standard anarytear methods.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and			

 Metric 6:
 Models
 N/A
 Rating of this factor is not applicable to this kind of information.

 Overall Quality Determination
 High

\* Related References: HERO ID 3615279 "Physical and chemical characteristics of UICC reference samples"

Study Citation: OECD Harmonized	Lebaron, E. I., Boo Particle Size	ettner, E. A. (1980). Fiber mot	ion analysis by two-puls	e holography. Applied Optics 19(6):891-894.			
Template:							
HERO ID:	<b>ID:</b> 3615886						
			EXTRACTIO	DN			
Parameter		Data					
Aerodynamic Value		ca_lower 34.0 +/-2.8 um -					
CASRN and Test Material		12001-28-4; crocidolite					
Confidentiality, Type, and	Guideline	None; Experimental; Double-pu	ilse in-line Fraunhofer holo	pgraphy aerosol spectrometer			
Solvent, Reactivity, Storag	e, and Stability	NA; NR; NR; NR	NA; NR; NR				
Radiolabel, Source, State,	and Purity	NR; NR; fiber solid; NR Notes: NR					
Method Type, Particle, Dis	stribution, and Particle	Laser scattering/diffraction; primary particle; counted distribution; Not Reported					
Size Geometric Standard Devia	tion	ca_lower 12.3 +/-5.4 um -					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		X = -0.05 + -0.34 cm, $Y = 0.02 + -0.46$ cm, $Z = 1.09 + -0.48$ cm, $L = 145 + -100$ um					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
			EVALUATIO	N .			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Matria 2.	Appropriateness	N/A	Pating of this factor is not applicable to this kind of information			

			8	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Palia	hility			
Domain 2. Test Kena		5 11 1 11 17 1 1 I		
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	
•	v		0	

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 759182 Table: 1 of 2

Study Citation: OECD Harmonized	Lowers, H. A., Ber Particle Size	rn, A. M. (2009). Particle size characterization of water-elutriated Libby amphibole 2000 and RTI international amosite. :3.				
HERO ID:	759182					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		NR - NR				
CASRN and Test Material		1318-09-8; Libby amphibole				
Confidentiality, Type, and	Guideline	None; Experimental; Non-guideline: total particle characterization; scanning electron microscopy (SEM)				
Solvent, Reactivity, Storage	e, and Stability	Water; NR; NR				
Radiolabel, Source, State, and Purity		NR; collected by the U.S. Geological Survey in 2000; NR; NR Notes: 1083 'LA' structure indexed samples; particles with aspect ratio (length divided by width) greater than 3 were labeled fiber, and those with aspect ratio less than three were labeled nonfiber regardless of phase identification				
Method Type, Particle, Dis	tribution, and Particle	microscopic examination; other; Not Reported				
Size Geometric Standard Deviat	tion	NR - NR NR				
Mean		NR - NR				
Standard Deviation Mean		NR				
Remarks		Length (µm): range 0.21973 to 23.5979, mean 1.95; width (µm): range 0.024358 to 2.59266, mean 0.316; aspect ratio ranged from 1.0 to 128.9, average: 7.1. Morphologies included: stepped, single fiber, blocky, tapered, amorphous, splayed/stepped, platy, splayed, split end.				
Page Number		Not Reported				
Passage NR - NR		NR - NR				
Mean Size Passage No		Not Reported				
Distribution		NR - NR				
Additional Passage Details		NR				

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliat	oility			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qual</b>	ity Determ	ination	High	

Continued on next page ...

Page 273 of 522

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

April 2024 Particle Size

HERO ID: 759182 Table: 1 of 2

		continued from previous page					
Study Citation:	Lowers, H. A., Bern, A. M. (2009). Particle size characterization of water-elutriated Libby amphibole 2000 and RTI international amosite. :3.						
<b>OECD Harmonized</b>	Particle Size						
Template:							
HERO ID:	759182						
		EVALUATION					
Domain	Metric	Rating	Comments				

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 759182 Table: 2 of 2

Study Citation:	Lowers, H. A., Ber	n, A. M. (2009). Particle size characterization of water-elutriated Libby amphibole 2000 and RTI international amosite. :3.				
OECD Harmonized	Particle Size					
Template:						
HERO ID:	759182					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		NR - NR				
CASRN and Test Material		12172-73-5; Amosite				
Confidentiality, Type, and C	Guideline	None; Experimental; Non-guideline: total particle characterization; SEM				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR				
Radiolabel, Source, State, and Purity		NR; collected by RTI International; NR; NR Notes: 878 samples analyzed; particles with aspect ratio (length divided by width) greater than 3 were labeled fiber, and those with aspect ratio less than three were labeled nonfiber regardless of phase identification				
Method Type, Particle, Dist	tribution, and Particle	microscopic examination; other; Not Reported				
Size	·					
Geometric Standard Deviati	1011					
Mean		NR - NR				
Standard Deviation Mean		NR				
Remarks		Length (µm): range 0.20633 to 103.582, mean 6.94; width (µm): range 0.018519 to 1.76127, mean 0.301; aspect ratio ranged from 1.0 to 360.3, average: 24.5. Morphologies included: stepped, single fiber, blocky, tapered, matrix, curved, splayed/stepped, platy, splayed, bladed				
Page Number		Not Reported				
Passage NR - NR		NR - NR				
Mean Size Passage Not Reported		Not Reported				
Distribution NR - NR		NR - NR				
Additional Passage Details		NR				

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features
Domain 2: Test Reliat	oility			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information
Overall Quality Determination High				

Study Citation: OECD Harmonized	Myasoedov, A. V., Particle Size	Kalmykov, A. E., Kirilenko, D. A., So	orokin, L. M. (20	017). TEM Investigation of Nanostructures with a High Aspect Ratio. :143-148.		
HERO ID:	6876819					
			EXTRACTIO	DN		
Parameter		Data				
		N				
Aerodynamic Value		Not Reported				
CASRN and Test Material	~	Not Reported; chrysotile	-			
Confidentiality, Type, and	Guideline	none; Experimental; high-resolution TE	М			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State,	and Purity	None; NR; fibers; NR				
Method Type, Particle, Dis	stribution, and Particle	microscopic examination; other; counted	distribution; Not	Reported		
S1Ze Geometric Standard Deviat	tion	Not Reported				
Meen		nm				
Standard Deviation Mean		Not Reported				
Remarks		Not Reported				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details	2	Not Reported				
reactional russage Dealis	,	The reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or other physical/chemical properties or behaviors.		
	••.					
Domain 2: Test Reliabil						
	Metric 3:	Reliability/Unbiased	Hıgh	The methodology for producing the information is designed to answer a specific ques-		
	Matria 1	(Method Objectivity) Reliability (Applytical Mathed	Uiah	non, and the methodology's objective is clear.		
	Metric 4:	Kenaointy/Analytical Method	nign	OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
				- **		
Overall Qualit	ty Determina	ation	High			

# **Overall Quality Determination**

Continued on next page ...

Page 276 of 522

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

April 2024

HERO ID: 6876819 Table: 1 of 1

		continued from previous page					
Study Citation:	Myasoedov, A. V., Kalmykov, A. E., Kirilenko, D. A., Sorokin, L. M. (2017). TEM Investigation of Nanostructures with a High Aspect Ratio. :143-148.						
OECD Harmonized	Particle Size						
Template:	(07(010						
HERO ID:	68/6819						
		EVALUATION					
Domain	Metric	Rating	Comments				

Particle Size

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3982328 Table: 1 of 1

Study Citation:	NIH. (2016). Report on carcinogens: Asbestos.					
<b>OECD</b> Harmonized	Particle Size					
Template:						
HERO ID:	3982328					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		NR - NR				
CASRN and Test Material		1332-21-4; chrysotile				
Confidentiality, Type, and C	Guideline	none; Not specified; not specified				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; occurs naturally; solid; NR				
Method Type, Particle, Dis	tribution, and Particle	other; other; Not Reported; Not Reported				
Size	ion					
Moon	1011	NK - NK NK				
Nicali Standard Deviation Maan		NK - NK				
Standard Deviation Mean						
Remarks		tiber bundles with lengths ranging from several millimeters to >10 cm				
Page Number		NOT REPORTED				
Fassage		NK - NK				
Distribution						
Additional Dessage Data !!-						
Additional Passage Details		NK				

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliab	oility					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>		High				
Continued on next page						

\_ ....

Page 278 of 522

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

continued from previous page						
Study Citation: OECD Harmonized Template: HERO ID:	NIH, (2016). Report on carcinogens: Asbestos. Particle Size					
Domain	Metric	<b>EVALUATION</b> Rating	Comments			

\* Related References: Primary source (not available in HERO at time of extraction) - Virta RL. 2002. Asbestos: Geology, Mineralogy, Mining and Uses. Open File Report 02-149. U.S. Geological Survey. http://pubs.usgs.gov/of/2002/of02-149/of02-149.pdf.

Study Citation:	Parsons, R. C., Bryant, D. G., Edstrom, H. W. (1986). Variation in fibre and dust counts in an asbestos mine and mill. Annals of Occupational Hygiene 30(1):63-75.					
<b>OECD Harmonized</b>	Particle Size					
Template:						
HERO ID:	3083397					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		not reported - not reported				
CASRN and Test Material		12001-29-5; chrystotile				
Confidentiality, Type, and C	Guideline	none; Experimental; Non-guideline monitoring study: atmospheric fiber density from midget impinger and membrane filter samplers in an asbestos mill during screening, refining, and bagging				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; asbestos mill air samples; NR; NR Notes: NR				
Method Type, Particle, Dis	tribution, and Particle	microscopic examination; other; counted distribution; Not Reported				
Size Geometric Standard Deviat	tion	not reported - not reported not reported				
Mean		not reported - not reported				
Standard Deviation Mean		not reported				
Remarks		Highest and second highest distribution classes were the 3.0-4.2 $\mu$ m and 4.3-6.0 $\mu$ m fibre length classes for both methods used (midget impinger MI and membrane filter MF) in all three mill zones; fiber density (f/mL) >1.5 $\mu$ m: screening = 6.5 (MI) and 5.9 (MF), refining = 2.0 (MI) and 1.6 (MF), and bagging = 1.4 (MI) and 0.8 (MF); fiber density (f/mL) >5 $\mu$ m: screening = 3.5 (MI) and 2.8 (MF), refining = 1.1 (MI) and 0.8 (MF), and bagging = 0.7 (MI) and 0.4 (MF); fiber density (f/mL) >7 $\mu$ m: screening = 1.2 (MI) and 1.0 (MF), refining = 0.4 (MI) and 0.3 (MF), and bagging = 0.2 (MI) and 0.2 (MF).				
Page Number		Not Reported				
Passage		not reported - not reported				
Mean Size Passage		Not Reported				
Distribution		1.5 μm - 24.2 other				
Additional Passage Details		Frequency distribution of atmospheric fiber from MF reported at fiber levels during screening, refining, and bagging, respectively: $<0.5$ f/mL = 6, 25, 32; 0.5-0.6 f/mL = 0, 14, 12; 0.7-0.9 f/mL = 1, 14, 13; 1.0-1.5 f/mL = 1, 6, 3; 1.6-2.0 f/mL = 3, 3, 1; 2.1-5.0 f/mL = 19, 1, 2; 5.1-10.0 f/mL = 16, 0, 0; 10.1-20.0 f/mL = 14, 0, 0; 20.1-30.0 f/mL = 3, 0, 0.				

EVALUATION					
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliab	oility				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is non-standard but is expected to be appropriate.	

Domain 3: Other

Continued on next page ...

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

Study Citations	Damage D. C.	Descent D.C. Editore II.W	(1006) Venietien in flue	
Study Citation:	20(1):63-75	, Bryant, D. G., Edstrom, H. W	. (1980). variation in libre	and dust counts in an aspestos mine and mill. Annais of Occupational Hygiene
<b>OECD Harmonized</b>	Particle Size			
Template:				
HERO ID:	3083397			
			EVALUATIO	N
Domain		Metric	Rating	Comments
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Study Citation:	Patitsas, A. J. (1988). SIZE CHARACTERIZATION OF ASBESTOS FIBERS USING THE RAYLEIGH-DEBYE-GANS THEORY. Journal of Colloid				
<b>OECD Harmonized</b>	and Interface Science :15-23. Particle Size				
Template:					
HERO ID:	6872531				
		EXTRACTION			
Parameter		Data			
Aerodynamic Value		less than 3 um (from HERO ID 3101448)			
CASRN and Test Material		77536-67-5; anthophyllite			
Confidentiality, Type, and Guideline		None; Calculation; Rayleigh-Debye-Gans approximate theory used to calculate fiber diameter and length distribution functions by fitting light scattering data from liquid suspensions			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; UICC sample; fiber (solid); NR Notes: UICC anthophyllite fibers			
Method Type, Particle, Dis	tribution, and Particle	other; other; Not Reported; Not Reported			
Size Geometric Standard Deviat	tion	Not Peparted			
Mean	non	Not Reported			
Standard Deviation Mean		Not Reported			
Remarks		Not Reported			
Kelliarks		modal diameter = $0.238$ , $0.359$ and $0.323$ um, respectively.			
Page Number		Not Reported			
Passage		Not Reported			
Mean Size Passage		Not Reported			
Distribution		Not Reported			
Additional Passage Details		Not Reported			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information (calculation).
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Continued on next page ...

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

HERO ID: 6872531 Table: 1 of 1

		continued from previous page				
Study Citation:	Patitsas, A. J. (1988). SIZE CHARACTERIZATION OF ASBESTOS FIBERS USING THE RAYLEIGH-DEBYE-GANS THEORY. Journal of Colloid					
OECD Harmonized	and Interface Science :15-23. Particle Size					
Template:						
HERO ID:	6872531					
EVALUATION						
Domain	Metric	Rating	Comments			

High

\* Related References: Citing Timbrell V. (1972) Microscope 20, 365. HERO ID 3101448.

**Overall Quality Determination** 

Page 283 of 522

Study Citation: OECD Harmonized	Spurny, K. R. (1989). On the release of asbestos fibers from weathered and corroded asbestos cement products. Environmental Research 48(1):100-116. Particle Size			
Template: HERO ID:	380			
		EXTRACTION		
Parameter		Data		
Aerodynamic Value		0.1 um - 0.5 um		
CASRN and Test Material		Not Reported: Ashestos		
Confidentiality, Type, and	Guideline	None: Experimental: Nuclepore filters samples and SEM analysis and Individual fibers were identified by energy dispersive X-ray analysis		
Solvent, Reactivity, Storag	e, and Stability	None; NR; NR		
Radiolabel, Source, State,	and Purity	NR; Air samples; NR; NR Notes: NR		
Method Type, Particle, Dis	stribution, and Particle	microscopic examination; primary particle; other; Not Reported		
Size	4°			
Geometric Standard Devia	tion	0.09 -		
Stendend Desietien Meen		Not Reported		
Pemarke		NOL REPORTED Magan diamatan = 0.22 ym ymaan lanath = 4.0 ym /S. d. 2.0, ganga 1.7.0 Sym), MEAN SIZE VAL HES OF EMITTED FIDEDS (CMF), tatal minaral		
KemarKS		fibers (GMF)		
Page Number		Not Reported		
Passage		Not Reported		
Mean Size Passage		Not Reported		
Distribution		Not Reported		
Additional Passage Details		Not Reported		

EVALUATION					
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliab	oility				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Quality Determination</b>		High			
Continued on next page					

Page 284 of 522

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

April 2024 Particle Size

HERO ID: 380 Table: 1 of 1

continued from previous page					
Study Citation: OECD Harmonized Template: HERO ID:	Spurny, K. R. (1989). On the release of asbestos fibers from weathered and corroded asbestos cement products. Environmental Research 48(1):100-116. Particle Size				
Domain	Metric	<b>EVALUATION</b> Rating	Comments		

\_

Study Citation:	Spurny, K. R., Stö 11(1):1-40.	ber, W., Opiela, H., Weiss, G. (1979)	. On the evaluation of	fibrous particles in remote ambient air. Science of the Total Environment
OECD Harmonized	Particle Size			
Template: HERO ID:	2073705			
			EXTRACTION	
Parameter		Data		
Aerodynamic Value		0.01 um - 0.5 um		
CASRN and Test Material		1332-21-4; amosite		
Confidentiality, Type, and C	Guideline	None; Experimental; None, sampling fib	rous particles in ambient	air and asbestos fibers was made by electron microprobe analysis
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; asbestos clouds and urban and non-	urban ambient air; solid f	iber; NR Notes: NR
Method Type, Particle, Dis	tribution, and Particle	microscopic examination; primary partic	ele; other; Not Reported	
Size Geometric Standard Deviat	tion	Not Reported		
Mean		Not Reported		
Standard Deviation Mean		Not Reported		
Remarks		Not Reported		
Page Number		Not Reported		
Passage		Not Reported		
Mean Size Passage		Not Reported		
Distribution		Not Reported		
Additional Passage Details		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Test Reliabil	ity			
2 chian 2. Test Rendon	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)	1110010111	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
Domain 5. Outer	Metric 5	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
			1.1/11	And of the factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determina	ation	Medium	

Study Citation:	Spurny, K. R., Stöber, W., Opiela, H., Weiss, G. (1979). Size-selective preparation of inorganic fibers for biological experiments. American Industrial					
OECD Harmonized	Particle Size	on Journal 40(1).20-38.				
Template:	(9(7)17					
HERO ID:	6867217					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		12172-73-5; amosite				
Confidentiality, Type, and	Guideline	none; Experimental; Non-guideline study				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR				
Radiolabel, Source, State, and Purity		NR; UICC Standard Reference; Solid fibers; NR Notes: samples were size-separated into very fine and fine fibers				
Method Type, Particle, Distribution, and Particle		microscopic examination; other; Not Reported; Not Reported				
Geometric Standard Deviat	tion	Not Reported				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Very fine fiber fraction: representative mean length 1.17 $\mu$ m (±0.47), mean fiber diameter 0.23 $\mu$ m (±0.07), aspect ratio = 5.40. Lengths $\leq 1\mu$ m = 48.3%, lengths $\leq 3\mu$ m = 99%, diameters $\leq 0.1 \mu$ m = 2.1%, diameters $\leq 0.5 \mu$ m = 99%. Aspect ratios $\leq 3 = 6.2\%$ , aspect ratios $\leq 30 = 100\%$ . Fine fiber fraction: representative mean length 2.52 $\mu$ m (±1.44), mean fiber diameter 0.47 $\mu$ m (±0.17), aspect ratio = 5.29. Lengths $\leq 3 \mu$ m = 72.1%, lengths $\leq 10 \mu$ m = 100%, diameters $\leq 0.5 \mu$ m = 66.4%, diameters $\leq 1.0 \mu$ m = 98.1%. Aspect ratios $\leq 5 = 57.2\%$ , aspect ratios $\leq 50 = 100\%$ .				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				

EVALUATION					
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
	1.				
Domain 2: Test Reliabi	lity				
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-	
		(Method Objectivity)		tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	

Continued on next page ...

Page 287 of 522

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

HERO ID: 6867217 Table: 1 of 3

continued from previous page					
Study Citation:	Spurny, K. R., Stöber, W., Opiela, H., Weiss,	G. (1979). Size-selective preparation of	of inorganic fibers for biological experiments. American Industrial		
OECD Harmonized	Particle Size				
Template:					
HERO ID:	6867217				
EVALUATION					
Domain	Metric	Rating	Comments		
<b>Overall Quali</b>	Overall Quality Determination High				
## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 6867217 Table: 2 of 3

Study Citation: Spurny, K. R., Stöber, W., Opiela, H., Weiss, G. (1979). Size-selective preparation of inorganic fibers for biological experiments. American Hygiene Association Journal 40(1):20-38.						
OECD Harmonized	Particle Size					
Template:						
HERO ID:	6867217					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		12001-29-5; chrysotile				
Confidentiality, Type, and	Guideline	none: Experimental: Non-guideline study				
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR				
Radiolabel, Source, State,	and Purity	NR; UICC Standard Reference; Solid fibers; NR Notes: samples were size-separated into very fine and fine fibers				
Method Type, Particle, Dis	tribution, and Particle	microscopic examination; other; Not Reported; Not Reported				
Size						
Geometric Standard Devia	tion	Not Reported				
Mean		Not Reported				
Standard Deviation Mean		Not Reported $(1, 2, 3, 4, 5)$ $(1, 2, 3, 4, 5)$ $(1, 2, 3, 5)$ $(1, 2, 3, 5)$ $(1, 2, 3, 5)$ $(1, 3, 5)$ $(1, 3, 5)$				
Remarks		very line liber fraction: representative mean length 1.11 $\mu$ m (±0.58), mean liber diameter 0.15 $\mu$ m (±0.04), aspect ratio = 8.90. Lengths $\leq 1 \mu$ m = 58.1%, lengths $\leq 3 \mu$ m = 99%, diameters $\leq 0.1 \mu$ m = 33.2%, diameters $\leq 0.5 \mu$ m = 100%. Aspect ratios $\leq 3 = 0.5$ %, aspect ratios $\leq 30 = 100$ %. Fine fiber fraction: representative mean length 1.42 $\mu$ m (±0.83), mean fiber diameter 0.16 $\mu$ m (±0.04), aspect ratio = 9.18. Lengths $\leq 3 \mu$ m = 95.1%, lengths $\leq 10 \mu$ m = 100%, diameters $\leq 0.5 \mu$ m = 100%, diameters $\leq 1.0 \mu$ m = NA. Aspect ratios $\leq 5 = 17.3$ %, aspect ratios $\leq 50 = 99$ %.				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabi	lity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 6867217 Table: 3 of 3

Study Citation: Spurny, K. R., Stöber, W., Opiela, H., Weiss, G. (1979). Size-selective preparation of inorganic fibers for biological experiments. Americ Hygiene Association Journal 40(1):20-38.						
OECD Harmonized	Particle Size					
Template:						
HERO ID:	6867217					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		12001-28-4; crocidolite				
Confidentiality, Type, and	Guideline	none; Experimental; Non-guideline study				
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR				
Radiolabel, Source, State,	and Purity	NR; UICC Standard Reference; Solid fibers; NR Notes: samples were size-separated into very fine and fine fibers				
Method Type, Particle, Dis	stribution, and Particle	microscopic examination; other; Not Reported; Not Reported				
Size	.•					
Geometric Standard Devia	tion	Not Reported				
Mean		Not Reported				
Standard Deviation Mean						
Remarks		Very line hoer fraction: representative mean length 1.35 $\mu$ m (±0.85), mean hoer diameter 0.21 $\mu$ m (±0.12), aspect ratio = 6.75. Lengths $\leq 1 \mu$ m = 46.1%, lengths $\leq 3 \mu$ m = 97.3%, diameters $\leq 0.1 \mu$ m = 2.1%, diameters $\leq 0.5 \mu$ m = 100%. Aspect ratios $\leq 3 = 0.8$ %, aspect ratios $\leq 30 = 100$ %. Fine fiber fraction: representative mean length 1.39 $\mu$ m (±0.89), mean fiber diameter 0.23 $\mu$ m (±0.06), aspect ratio = 6.98. Lengths $\leq 3 \mu$ m = 93.4%, lengths $\leq 10 \mu$ m = 100%, diameters $\leq 0.5 \mu$ m = 99%, diameters $\leq 1.0 \mu$ m = 100%. Aspect ratios $\leq 5 = 46.8$ %, aspect ratios $\leq 50 = 100$ %.				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabi	lity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>						

Study Citation: OECD Harmonized	Timbrell, V. (1982) Particle Size	Timbrell, V. (1982). Deposition and retention of fibres in the human lung. Annals of Occupational Hygiene 26(1-4):347-369. Particle Size					
Template: HERO ID:	29927						
		EXTRACTION					
Parameter		Data					
Aerodynamic Value		0.44 and 3.8 μm (mine), 0.52 and 4.8 μm (mill), 0.70 and 10 μm (bagging) -					
CASRN and Test Material		17068-78-9; Anthophyllite					
Confidentiality, Type, and	Guideline	None; Experimental; NA					
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NA; Mine, mill, and bagging area dust samples in Paakkilla mine; Solid; NR					
Method Type, Particle, Dis	stribution, and Particle	determination of fibre length and diameter distributions; aggregate; counted distribution; Not Reported					
Size	4°	21(-1)274(-1)22(					
Geometric Standard Devia	tion	2.16 and 2.74 (mine), 1.95 and 2.42 (min), 2.26 and 2.94 (dagging) -					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		Not Reported					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabi	ility					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
		(Method Objectivity)		tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

Study Citation:	Timbrell, V., Gritti	Timbrell, V., Grittiths, D. M., Pooley, F. D. (1971). Possible Biological Importance of Fibre Diameters of South African Amphiboles. Nature 232(5305):55-					
<b>OECD Harmonized</b>	56. Particle Size						
<b>Femplate:</b>							
HERO ID:	3097547						
		EXTRACTION					
Parameter		Data					
Aerodynamic Value		North-western Cape mines: Mean fiber diameter: 0.073 $\mu$ m; Mean aerodynamic diameter: 0.09 - 0.8 $\mu$ m. Transvaal mines: Mean fiber diameter: 0.212 $\mu$ m.					
CASRN and Test Material		12001-28-4; Crocidolite					
Confidentiality, Type, an	d Guideline	None; Experimental; None					
olvent, Reactivity, Stor	age, and Stability	NR; NR; NR					
adiolabel, Source, State	e, and Purity	NA; Mines in north-western Cape and Transvaal, South Africa; Solid; NR					
Aethod Type, Particle, I	Distribution, and Particle	determination of fibre length and diameter distributions; other; other; Not Reported					
Geometric Standard Dev	viation	Not Reported					
Iean		Not Reported					
tandard Deviation Mea	n	Not Reported					
lemarks		Not Reported					
Page Number		Not Reported					
Passage		Not Reported					
Iean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Deta	ils	Not Reported					

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabi	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	Medium	Analytical details are missing.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quali	ity Determ	ination	Medium	

Continued on next page ...

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

April 2024

Particle Size

HERO ID: 3097547 Table: 1 of 2

continued from previous page						
Study Citation:	Timbrell, V., Grittiths, D. M., Pooley, F. D. (1971). Possible Biological Importance of Fibre Diameters of South African Amphiboles. Nature 232(5305):55-					
OECD Harmonized	56. Particle Size					
Template: HERO ID:	3097547					
		EVALUATION				
Domain	Metric	Rating	Comments			

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3097547 Table: 2 of 2

Study Citation:	Timbrell, V., Grittiths, D. M., Pooley, F. D. (1971). Possible Biological Importance of Fibre Diameters of South African Amphiboles. Nature 232(5305):55-						
OECD Harmonized	56. Particle Size						
Template:	Tartiele Size						
HERO ID:	3097547						
			EXTRACTION				
Parameter		Data					
Aerodynamic Value		Mean fiber diameter: 0.243 µm -					
CASRN and Test Material		12172-73-5; Amosite					
Confidentiality, Type, and G	Guideline	None; Experimental; None					
olvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, ar	nd Purity	NA; Mines in Transvaal, South Africa; So	lid; NR				
Method Type, Particle, Dist	ribution, and Particle	determination of fibre length and diameter	distributions; other; ot	her; Not Reported			
Size Geometric Standard Deviati	ion	Not Reported					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		Not Reported					
Page Number		Not Reported					
Passage		Not Reported					
Mean Size Passage		Not Reported					
Distribution		Not Reported					
Additional Passage Details		Not Reported					
Damain		Matria	EVALUATION	Commente			
Domain		Metric	Rating	Comments			
Jomain 1: Substance	34.1.1		TT: 1				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabili	ity						
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques			
		(Method Objectivity)	-	tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	Medium	Analytical details are missing.			
Domain 3: Other							
	Metric 5 <sup>.</sup>	Databases	N/A	Rating of this factor is not applicable to this kind of information			
		2 4440 4900	1.1.1				
	Metric 6	Models	N/A	Rating of this factor is not applicable to this kind of information			

Study Citation:	U.S. EPA, (2014).	Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System				
OECD Harmonized	(IRIS). Particle Size					
Femnlate:	Tartiele Size					
HERO ID:	3827272					
			EXTRACTIO	N .		
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		1318-09-8; Libby amphibole				
Confidentiality, Type, and C	Guideline	Not Reported; Not Reported; Not Re	ported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR	*			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR				
Aethod Type, Particle, Dis	tribution, and Particle	other; primary particle; counted distr	ibution; Not Reported			
ize			*			
Beometric Standard Deviat	ion	Not Reported				
Mean		=0.1  (width); <1  (length) - =1.0  (width); >/=100  (length) & micro; m				
tandard Deviation Mean		not reported				
Remarks		cumulative particle-size-distribution frequencies of LA fibers (aspect ratio $\geq 3:1$ ) in in Libby ore Grade 3, expanded Libby ore Grade 3, and ambient				
Page Number		air samples collected in Liddy Not Reported				
assage		Not Reported				
Aean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				
			FVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		

	Metric 4:	(Method Objectivity) Reliability/Analytical Method	Medium	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear. The analytical method is non-standard but is expected to be appropriate OR the analyti- cal method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.

Continued on next page ...

			April 2024	
S	Particle Size			HERO ID: 3827272 Table: 1 o
			continued from previous p	page
Study Citation:	U.S. EPA, (20 (IRIS).	014). Toxicological review of	libby amphibole asbestos: In supp	port of summary information on the Integrated Risk Information System
OECD Harmonized	Particle Size			
Template:				
Template: HERO ID:	3827272			
Template: HERO ID:	3827272		EVALUATION	
Template: HERO ID: Domain	3827272	Metric	EVALUATION Rating	Comments

PUBLIC RELEASE DRAFT - DO NOT CITE OR QUOTE

\* Related References: U.S. EPA (U.S. Environmental Protection Agency). (2010b). Particle size distribution data for Libby Amphiboles structures observed in air at the Libby Asbestos Superfund Site [EPA Report]. Denver, CO. HERO ID 759201

Study Citation: OECD Harmonized	USGS, (2009). Pa Particle Size	rticle size characterization of water-elutriated libby amphibole 2000 and RTI international amosite.		
Template: HERO ID:	3975014			
		EXTRACTION		
Parameter		Data		
Aerodynamic Value		Not Reported		
CASRN and Test Material		1318-09-8; Libby amphibole		
Confidentiality, Type, and	Guideline	none; Experimental; Non-guideline: particle characterization by SEM		
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR		
Radiolabel, Source, State, and Purity		NR; Field samples collected by the U.S.G.S in 2000; solid; both fiber and non-fiber; NR		
Method Type, Particle, Di	istribution, and Particle	microscopic examination; primary particle; other; Not Reported		
Size Geometric Standard Devia	ation	Not Reported		
Mean		Not Reported		
Standard Deviation Mean		Not Reported		
Remarks		Not Reported		
Page Number		Not Reported		
Passage		Not Reported		
Mean Size Passage		Not Reported		
Distribution		Not Reported		
Additional Passage Details		1081 samples analyzed via scanning electron microscopy. Fiber (particles with aspect ratio >3) sample sizes ranged from 0.347783 to 23.5979 $\mu$ m (length) and 0.24358 to 1.32475 (width) Non-Fiber (particles with aspect ratio <3) sample sizes ranged from 0.21973 to 3.09938 $\mu$ m (length) and 0.0998251 to 2.59266 $\mu$ m (width) Morphology of the samples included: stepped, blocky, single fiber, platy, and tapered.		

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical method.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

Continued on next page ...

Page 297 of 522

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

April 2024 Particle Size

HERO ID: 3975014 Table: 1 of 2

		continued from previous page	
Study Citation:	USGS, (2009). Particle size characterization of	f water-elutriated libby amphibole 2000 a	nd RTI international amosite.
<b>OECD Harmonized</b>	Particle Size		
Template:			
HERO ID:	3975014		
		EVALUATION	
Domain	Metric	Rating	Comments

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Particle Size

HERO ID: 3975014 Table: 2 of 2

Study Citation: OECD Harmonized	USGS, (2009). Particle size characterization of water-elutriated libby amphibole 2000 and RTI international amosite. Particle Size				
Template: HERO ID:	3975014				
		EXTRACTION			
Parameter		Data			
Aerodynamic Value		Not Reported			
CASRN and Test Material		12172-73-5; amosite			
Confidentiality, Type, and	Guideline	none; Experimental; Non-guideline: particle characterization by SEM			
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR			
Radiolabel, Source, State,	and Purity	NR; Field samples collected by RTI International; solid; both fiber and non-fiber; NR			
Method Type, Particle, Dis	stribution, and Particle	microscopic examination; primary particle; other; Not Reported			
Size					
Geometric Standard Devia	tion	Not Reported			
Mean		Not Reported			
Standard Deviation Mean		Not Reported			
Remarks		Not Reported			
Page Number		Not Reported			
Passage		Not Reported			
Mean Size Passage		Not Reported			
Distribution		Not Reported			
Additional Passage Details		878 samples analyzed via scanning electron microscopy. Fiber (particles with aspect ratio >3) sample sizes ranged from 0.473036 to 103.582 $\mu$ m (length) and 0.018519 to 1.33806 (width) Non-Fiber (particles with aspect ratio <3) sample sizes ranged from 0.20633 to 2.39866 $\mu$ m (length) and 0.121707 to 1.7627 $\mu$ m (width) Morphology of the samples included: single fiber, tapered, stepped, blocky, matrix, curved, platy, splayed/stepped, bladed, splayed.			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical method.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination				

HERO ID: 3975020 Table: 1 of 4

Study Citation:	USGS, (2002). As	bestos: Geology, mineralogy, mining	g, and uses.			
OECD Harmonized	Particle Size					
Template:	2075020					
HERO ID:	3975020					
			EXTRACTIO	N		
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; None				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; Solid, fibers; NR Notes: NR				
Method Type, Particle, Dis	tribution, and Particle	other; primary particle; Not Reported; Not Reported				
Size Geometric Standard Deviat	ion	Not Doported				
Mean	1011	Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Surface area = $15 - 30 \text{ m}^2/\text{g}$ , measured by BET nitrogen adsorption.				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				
C						
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or		
			2	other physical/chemical properties or behaviors.		

Overall Quality Determination			High	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
Domain 2: Test Relia	bility			

Page 300 of 522

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

HERO ID: 3975020 Table: 1 of 4

		continued from previous page				
Study Citation:	USGS, (2002). Asbestos: Geology, mineralogy	, mining, and uses.				
OECD Harmonized	Particle Size					
Template:						
HERO ID:	3975020					
		EVALUATION				
Domain	Metric	Rating	Comments			

\* Related References: No citations reported.

HERO ID: 3975020 Table: 2 of 4

Study Citation:	USGS, (2002). Asl	pestos: Geology, mineralogy, mining, and uses.			
<b>OECD Harmonized</b>	Particle Size				
Template:					
HERO ID:	3975020				
		EXTRACTION			
Parameter		Data			
Aerodynamic Value		Not Reported			
CASRN and Test Material		12001-28-4; Crocidolite			
Confidentiality, Type, and C	Juideline	None; Experimental; None			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid, fibers; NR Notes: NR			
Method Type, Particle, Dist	tribution, and Particle	other; primary particle; Not Reported; Not Reported			
Size Geometric Standard Deviat	ion	Not Reported			
Mean		Not Reported			
Standard Deviation Mean		Not Reported			
Remarks		Surface area = $1.8 - 9 \text{ m}^{2/\sigma}$			
Page Number		Not Reported			
Passage		Not Reported			
Mean Size Passage		Not Reported			
Distribution		Not Reported			
Additional Passage Details		Not Reported			
-					
		EVALUATION			
р :					

Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Relia	bility			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

\* Related References: Cites A. A. Hodgson and C. A. White, Papers 2-10, The Physics and Chemistry of Asbestos Minerals, Oxford Conference on Asbestos Minerals, Oxford, UK, 1967, No HEROID.

HERO ID: 3975020 Table: 3 of 4

Study Citation:	USGS, (2002), Ast	bestos: Geology, mineralogy, mining, and uses.		
<b>OECD</b> Harmonized	Particle Size			
Template:				
HERO ID:	3975020			
		EXTRACTION		
Parameter		Data		
Aerodynamic Value		Not Reported		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and C	Juideline	None; Experimental; None		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid, fibers; NR Notes: NR		
Method Type, Particle, Dist	ribution, and Particle	other; primary particle; Not Reported; Not Reported		
Size	·	Net Dependent		
Geometric Standard Deviation				
Mean		Not Reported		
Standard Deviation Mean		Not Reported		
Remarks		Surface area = $1.3 - 5.5 \text{ m}^2/\text{g}$		
Page Number		Not Reported		
Passage		Not Reported		
Mean Size Passage		Not Reported		
Distribution		Not Reported		
Additional Passage Details		Not Reported		

Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliab	oility			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

\* Related References: Cites A. A. Hodgson and C. A. White, Papers 2-10, The Physics and Chemistry of Asbestos Minerals, Oxford Conference on Asbestos Minerals, Oxford, UK, 1967, No HEROID.

HERO ID: 3975020 Table: 4 of 4

Study Citation:	USGS, (2002). As	bestos: Geology, mineralogy, mining	g, and uses.			
OECD Harmonized	Particle Size					
Template:						
HERO ID:	3975020					
			EXTRACTIO	N		
Parameter		Data				
Aerodynamic Value		Not Reported				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; None				
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid, fibers; NR Notes: NR				
Method Type, Particle, Dist	ribution, and Particle	Not Reported; primary particle; Not Reported; Not Reported				
Size Geometric Standard Deviati	ion	Not Reported				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Unit fiber diameter = 25 nm (average); Industrial fiber aggregate diameter = 0.1 to 100 um				
Page Number		Not Reported		-		
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Co	omments	
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical	substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this	kind of information.	

Domain 2: Test Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qua	lity Determ	ination	High	

\* Related References: No citations reported.

Study Citation:	Van Orden, D. R.,	Lee, R. J., Badger, S. (2006). Characterizing asbestos fiber comminution resulting from preparation of environmental samples. Powder	
OFCD Harmonized	Technology 162(3)	):183-189.	
OECD Harmonized	Particle Size		
HERO ID:	358/0/0		
	550+9+9		
		EXTRACTION	
Parameter		Data	
Aerodynamic Value		greater than or equal to 0.02 $\mu$ m - less than or equal to 0.05 $\mu$ m	
CASRN and Test Material		12001-29-5; chrysotile	
Confidentiality, Type, and	Guideline	none; Experimental; Non-guideline; measurement of asbestos particle size in air samples collected in 2002-2003 inside and outside of the World Trade Center (over 2 yrs following World Trade Center towers collarse); analysis via transmission electron microscope	
Solvent, Reactivity, Storag	e, and Stability	NR; NR; Samples were collected on mixed cellulose ester filters and prepared in general accordance with standard direct preparation methodolo- gies.: NR	
Radiolabel, Source, State,	and Purity	NR; WTC air samples; single fibers; with a few bundles; NR	
Method Type, Particle, Dis	stribution, and Particle	microscopic examination; other; mass based distribution; D99	
Size	tion	Not Departed	
Geometric Standard Devia	uon		
Mean		greater than or equal to Length: 2 $\mu$ m (directly prepared samples) 0.43 $\mu$ m (indirectly prepared samples) - less than or equal to Length: 24.3 $\mu$ m (directly prepared samples) 10 $\mu$ m (indirectly prepared samples) & micro;m	
Standard Deviation Mean		not reported	
Remarks		Asbestos fibers characterized as particles with an aspect ratio of 5:1 or greater (length/width). The minimum fiber length was restricted to 0.5 µm	
Page Number		in accordance with the method used. Not Reported	
Passage		not reported - not reported	
Mean Size Passage		Not Reported	
Distribution		not reported - not reported	
Additional Passage Details	6	not reported	

EVALUATION					
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
	Continued on next page				

		April 2024	
OS		Particle Size	HERO ID: 3584949 Table: 1
		continued from provides page	
		continueu from previous page	
Study Citation:	Van Orden, D. R., Lee, R. J., Badger, S. (2006 Technology 162(3):183-189.	). Characterizing asbestos fiber comminution	resulting from preparation of environmental samples. Powder
<b>OECD Harmonized</b>	Particle Size		
Template:			
HERO ID:	3584949		
		EVALUATION	
Domain	Metric	Rating	Comments
<b>Overall Qualit</b>	ty Determination	High	

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

Study Citation: Virta, R. L., Seg	reti, J. M. (1987). A MODEL FOR PREI	DICTING CRO	CIDOLITE FIBER SIZE DISTRIBUTIONS. Environmental Research 44(1):148-		
OECD Harmonized Particle Size					
<b>HERO ID:</b> 3584086					
		EXTRACTIO	N .		
Parameter	Data				
A aradunamia Valua	0.02  up (width) = 0.20  up (width)				
CASRN and Test Material	12001-28-4: Crocidolite				
Confidentiality Type and Guideline	None: Experimental: Not Reported				
Solvent Reactivity Storage and Stability	Filtered distilled water: NR: NR: NR				
Radiolabel Source State and Purity	NA: NR: Solid blocky to fibrous: NR No	tes: 7 samples			
Method Type, Particle, Distribution, and Particl	e determination of fibre length and diamete	r distributions; otl	her; counted distribution; Not Reported		
Size					
Geometric Standard Deviation	Not Reported				
Mean	Not Reported				
Standard Deviation Mean	Not Reported				
Remarks	Not Reported				
Page Nulliber	Not Reported				
A assage	Not Reported				
Distribution	Not Reported				
Additional Passage Details	Not Reported				
			N		
Domain	Metric	Rating	Comments		
Domain 1: Substance		0			
Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliability					
Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
	(Method Objectivity)	U	tion, and the methodology's objective is clear.		
Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other					
Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determin</b>	nation	High			
	Cont	inued on next	page		

Page 307 of 522

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

Asbestos

HERO ID: 3584086 Table: 1 of 1

		continued from previous page	
Study Citation:	Virta, R. L., Segreti, J. M. (1987). A MODEL F	FOR PREDICTING CROCIDOLITE FIB	ER SIZE DISTRIBUTIONS. Environmental Research 44(1):148-
OECD Harmonized	160. Particle Size		
Template:			
HERO ID:	3584086		
		EVALUATION	
Domain	Metric	Rating	Comments

Study Citation:	Virta, R. L., Shedd	I, K. B., Wylie, A. G., Snyder, J. G. (1983). Chapter 47. Size and shape characteristics of amphibole asbestos (amosite) and amphibole			
OECD Harmonized	Particle Size	s (actinolite, cummingtonite) collected on occupational air monitoring filters. :633-643.			
Template: HERO ID:	3101498				
		FXTRACTION			
Parameter		Data			
Aerodynamic Value		Not Reported			
CASRN and Test Material		77536-66-4; actinolite			
Confidentiality, Type, and	Guideline	none; Experimental; none			
Solvent, Reactivity, Storage	e, and Stability	Not Reported; Not Reported; Not Reported; Not Reported			
Radiolabel, Source, State, a	and Purity	Not Reported; Mining samples containing actinolite were obtained from air monitoring filters from Mine Safety and Health Administration (from stone quarry and iron mining operations in amphibole-bearing rocks).; Not Reported; Not Reported Notes: Ca2(Mg, Fe)5Si8O22(OH)2			
Method Type, Particle, Dis Size	stribution, and Particle	microscopic examination; other; Not Reported			
Geometric Standard Deviat	tion	Not Reported			
Mean		Not Reported			
Standard Deviation Mean		Not Reported			
Remarks		Airborne Mining Sample Particle Sizes: Homestake Gold Mine: # of particle = 266; mean length ( $\mu$ m) = 4.6 (range 0.9 - 17.5), mean width ( $\mu$ m) = 1.1 (range 0.3 - 4.8). Peter Mitchell Iron Mine: # of particle = 464; mean length ( $\mu$ m) = 5.5 (range 1.0 - 32.4), mean width ( $\mu$ m) = 1.2 (range 0.2 - 5.0). Charlottesville Crushed Stone: # of particle = 605; mean length ( $\mu$ m) = 5.3 (range 0.8 - 36.0), mean width ( $\mu$ m) = 1.4 (range 0.2 - 12.0).			
Page Number		Not Reported			
Passage		Not Reported			
Mean Size Passage		Not Reported			
Distribution		Not Reported			
Additional Passage Details		Scanning electron microscopy (SEM) and energy-dispersive X-ray spectroscopy (EDS) analysis; Most non-amphibole particles were eliminated based on the criteria set: minimum of 250 particles with aspect ratio ~2:1 for the mining site samples and ~3:1 for the industrial site samples, straight sides, and suitable amphibole composition were measured.			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
		Co	ntinued on next p	page

stos		PUBLIC I	RELEASE DRAFT – DO NOT CITE OR QU April 2024 Particle Size	HERO ID: 3101498 Table: 1 of
			continued from previous page	
Study Citation:	Virta, R. L., S cleavage fragm	Shedd, K. B., Wylie, A. G., Sr ments (actinolite, cummingtor	yder, J. G. (1983). Chapter 47. Size and shape char nite) collected on occupational air monitoring filters.	racteristics of amphibole asbestos (amosite) and amphibole :633-643.
	Particle Size			
OECD Harmonized	Particle Size			
OECD Harmonized Template:	Particle Size			
OECD Harmonized Template: HERO ID:	3101498			
OECD Harmonized Template: HERO ID:	3101498		EVALUATION	
OECD Harmonized Template: HERO ID: Domain	3101498	Metric	<b>EVALUATION</b> Rating	Comments

Study Citation:	Virta, R. L., Shedd cleavage fragment	I, K. B., Wylie, A. G., Snyder, J. G. (1983). Chapter 47. Size and shape characteristics of amphibole asbestos (amosite) and amphibole s (actinolite, cummingtonite) collected on occupational air monitoring filters. :633-643.		
OECD Harmonized	Particle Size	( ( control contro		
Template:				
HERO ID:	3101498			
		EXTRACTION		
Parameter		Data		
Aerodynamic Value		Not Reported		
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and	Guideline	none; Experimental; none		
Solvent, Reactivity, Storag	ge, and Stability	Not Reported; Not Reported; Not Reported; Not Reported		
Radiolabel, Source, State,	and Purity	Not Reported; Industrial samples containing amosite were obtained from Occupational Safety and Health Administration (from shipyard and electric company industrial sites employing asbestos).; Not Reported; Not Reported Notes: (Mg,Fe)7Si8O22(OH)2		
Method Type, Particle, Dis	stribution, and Particle	microscopic examination; other; other; Not Reported		
Size				
Geometric Standard Devia	ition	Not Reported		
Mean		Not Reported		
Standard Deviation Mean		Not Reported		
Remarks		Airborne Industrial Sample Particle Sizes: Shipyard: # of particle = 698; mean length ( $\mu$ m) = 8.2 (range 0.9 - 93.5), mean width ( $\mu$ m) = 0.4 (range 0.1 - 2.6). Electric Company: # of particle = 285; mean length ( $\mu$ m) = 15.6 (range 1.3 - 181.0), mean width ( $\mu$ m) = 0.5 (range 0.1 - 1.7).		
Page Number		Not Reported		
Passage		Not Reported		
Mean Size Passage		Not Reported		
Distribution		Not Reported		
Additional Passage Details	S	Scanning electron microscopy (SEM) and energy-dispersive X-ray spectroscopy (EDS) analysis; Most non-amphibole particles were eliminated based on the criteria set: minimum of 250 particles with aspect ratio ~2:1 for the mining site samples and ~3:1 for the industrial site samples, straight sides, and suitable amphibole composition were measured.		

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
		Сог	ntinued on next j	page

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

HERO ID: 3101498 Table: 2 of 2

		continued from previous page			
Study Citation:	Virta, R. L., Shedd, K. B., Wylie, A. G., Snyder, J. G. (1983). Chapter 47. Size and shape characteristics of amphibole asbestos (amosite) and amphibole asbestos (am				
OECD Harmonized Template:	Particle Size				
HERO ID:	3101498				
		EVALUATION			
Domain	Metric	Rating	Comments		
<b>Overall Quali</b>	ty Determination	High			

Study Citation: Wagner, J. (2015). Analysis of serpentine polymorphs in investigations of natural occurrences of asbestos. Environmental Science: Processe 17(5):985-996						
<b>OECD Harmonized</b>	Particle Size					
Template:						
HERO ID:	3531545					
			EXTRACTION			
Parameter		Data				
Aerodynamic Value		Mean Fiber width: $42\pm16$ nm -				
CASKN and Test Material	Cuidalina	Nana: Experimental: NA				
Connuentiality, Type, and C	ouldellife	None; Experimental; NA				
Badialabal Source State	e, and Stability	Alcollol, INK, INK NA: California, USA: Solid: ND Notes: Semples ground with morter and notice in clocked				
Mathad Type Dertiale Dis	and Purity	microscopic examination: other: other: Not Reported				
Size	surbution, and Farticle	incroscopic examination; other; other; not keported				
Geometric Standard Deviat	tion	Not Reported				
Mean		Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Morphology - Central canal: Sharp, uniform; fiber termination: rounded/uniform; fiber side edges: parallel				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details Not Reported						
			EVALUATION			
Domain		Metric	Rating	Comments		

Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard. Some study details are missing.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Continued on next page ...

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

Particle Size

HERO ID: 3531545 Table: 1 of 1

		continued from previous page				
Study Citation:	Wagner, J. (2015). Analysis of serpentine polymorphs in investigations of natural occurrences of asbestos. Environmental Science: Processes & Impacts					
OECD Harmonized	Particle Size					
Template:						
HERO ID:	3531545					
		EVALUATION				
Domain	Metric	Rating	Comments			
<b>Overall Quali</b>	ty Determination	Medium				

Study Citation: Webber, J. S., Blake, D. J., Ward, T. J., Pfau, J. C. (2008). Separation and characterization of respirable amphibole fibers from Libby, Montana. Inha				
OECD Hormonized	Toxicology 20(8):7	733-740.		
OECD Harmonized	Particle Size			
	711568			
IIERO ID.	/11508			
		EXTRACTION		
Parameter		Data		
Aerodynamic Value		less than or equal to 2.5 µm		
CASRN and Test Material		1318-09-8; Libby amphibole		
Confidentiality, Type, and G	luideline	None; Experimental; transmission electron microscope and scanning transmission electron microscope with x-ray detector		
Solvent, Reactivity, Storage,	, and Stability	sterile water; NR; NR; NR		
Radiolabel, Source, State, ar	nd Purity	NR; Libby 6-mix from USGS; "Libby 6-mix," includes a complex mixture of fiber sizes and nonfibrous material in addition to the respirable size fraction: solid: NR Notes: Libby 6-mix containing six amphibole fiber types, including winchite, richterite, and tremolite; separation of Libby		
		6-mix into respirable and nonrespirable size fractions by means of aqueous elutriation		
Method Type, Particle, Distr	ribution, and Particle	determination of fibre length and diameter distributions; primary particle; mass based distribution; Not Reported		
Size		Not Domostod		
Maar	011	Not Reported		
		Not Reported		
Standard Deviation Mean		Not Reported		
Remarks		Mean fiber dimensions of elutriated fibers were 2.7 $\mu$ m (length), 0.19 $\mu$ m (width), aspect ratio = 16. Surface area of elutriated fibers was 5.3 m-2 g-1, compared to 0.53 m-2 g-1 for the raw fibers and 8.1 m-2 g-1 measured for crocidolite; no detectable differences in chemical composition between larger and smaller fibers		
Page Number		Not Reported		
Passage		Not Reported		
Mean Size Passage		Not Reported		
Distribution		Not Reported		
Additional Passage Details		Respirable fraction (smaller than 2.5 µm) accounted for 13% of the raw Libby 6-mix mass); less than 2% has aerodynamic diameters greater than 2.5 µm; 98% of elutriated fibers were at or below respirable diameters. The Libby 6-mix is a mixture of fiber sizes and nonfibrous material and may not reflect historical samples from Libby MT.		

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliab	llity Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 3 <sup>.</sup> Other						
Domain 3: Other						

Continued on next page ...

			April 2024	
5	Particle Size			HERO ID: 711568 Table: 1
			continued from pre	vious page
Study Citation:	Webber, J. S., Toxicology 20	Blake, D. J., Ward, T. J., Pfau, . )(8):733-740.	J. C. (2008). Separation and	characterization of respirable amphibole fibers from Libby, Montana. Inhalation
OECD Harmonized	Particle Size			
Tomplato				
rempiace.				
HERO ID:	711568			
HERO ID:	711568		EVALUATIO	N
HERO ID:	711568	Metric	<b>EVALUATIO</b> Rating	N Comments
HERO ID:	711568 Metric 5:	Metric Databases	EVALUATIO Rating N/A	N Comments Rating of this factor is not applicable to this kind of information.

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE

Study Citation: OECD Harmonized	Wu, L., Ortiz, C. P., Jerolmack, D. J. (2017). Aggregation of Elongated Colloids in Water. Langmuir 33(2):622-629. Particle Size					
Template:	i unicie Sille					
HERO ID:	3531568					
		EXTRACTION				
Parameter		Data				
Aerodynamic Value		$1.9\pm0.5~\mu{ m m}$ -				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; None				
Solvent, Reactivity, Storage	e, and Stability	NA; NA; NA				
Radiolabel, Source, State, a	and Purity	NA; El Dorado Mine, Salt River, Arizona; Solid block; > 90%				
Method Type, Particle, Dis	tribution, and Particle	microscopic examination; primary particle; other; Not Reported				
Size Geometric Standard Deviat	ion	Not Reported				
Mean	1011	Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Not Reported				
Page Number		Not Reported				
Passage		Not Reported				
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage Details		Length = $10 \pm 0.8 \ \mu m$ (up to 20 $\mu m$ )				

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliat	oility					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is non-standard but is expected to be appropriate OR the analyti- cal method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
		Co	ntinued on next p	bage		

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE
April 2024

Particle Size

Asbestos

HERO ID: 3531568 Table: 1 of 1

	continued from previous page						
Study Citation: OECD Harmonized Template:	Wu, L., Ortiz, C. P., Jerolmack, D. J. (2017). Aggregation of Elongated Colloids in Water. Langmuir 33(2):622-629. Particle Size						
HERO ID:	3531568						
		EVALUATION					
Domain	Metric	Rating	Comments				
Overall Quali	Overall Quality Determination High						

HERO ID: 7607028 Table: 1 of 1

Study Citation:	ACToR, (2021).	ACToR: Asbestos.		
OECD Harmonized	Vapor Pressure			
Template:	•			
HERO ID:	7607028			
			EXTRACTIO	N
Parameter		Data		
Vapor Pressure		ca. 0.00E+00 - mm Hg		
CASRN and Test Material		1332-21-4; asbestos		
Confidentiality, Type, and	Guideline	none; approximation; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Temperature	-	not reported		
System		not reported		
Standard Deviation Results	5	not reported		
Results Details		approximate value		
			EVALUATIO	Ň
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Reported data are consistent with the subject chemical substance structural features.
	•,			
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Matria 4.	(Method Objectivity)	Madium	towards a particular product or outcome.
	Metric 4:	Renability/Analytical Method	Medium	I ne analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source
				inclusion in a per-reviewed/recognized database of other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quali</b>	ty Determi	nation	High	

\* Related References: Source cited: HERO ID 594566 and HERO ID 9109830 (secondary source which does not cite primary source). NIOSH Pocket Guide to Chemical Hazards (NPG), NIOSH Publication No. 97-140, February2004.

HERO ID: 3981007 Table: 1 of 1

Study Citation:	Cameo Chemica	als, (2016). Chemical datasheet: asbest	os.	
Tompleto:	vapor riessure			
HERO ID.	3081007			
	5981007			
_		_	EXTRACTIO	N
Parameter		Data		
Vapor Pressure		ca. 0 mm Hg		
CASRN and Test Material		1332-21-4; Asbestos		
Confidentiality, Type, and C	Guideline	None; experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Temperature		Not reported		
System		Not reported		
Standard Deviation Results		Not reported		
Results Details		Reported as approximate value		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features physical/chemical properties or behaviors.
Domain 2: Test Peliabil	ity.			
	Metric 2.	Reliability/Unbiased	Madium	There is no indication that the methodology for producing the information was biased
	Methe 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome
	Metric 4.	Reliability/Analytical Method	Medium	Analytical method is unknown but is likely to be appropriate based on the data's inclu-
	metric 1.	itemating, inary item intenied	mean	sion in a peer-reviewed/recognized database or other secondary source.
-				
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

\* Related References: NIOSH, 2016 cited but no other details available

HERO ID: 3981008 Table: 1 of 1

Study Citation: OECD Harmonized	dy Citation: Cameo Chemicals, (2016). Chemical datasheet: asbestos (blue). CD Harmonized Vapor Pressure			
Template:	apor ressure			
HERO ID:	3981008			
			FYTRACTIO	N
Parameter		Data	EATRACIIO	1
Vapor Pressure		ca. 0 - mm Hg		
CASRN and Test Material		12001-28-4; crocidolite		
Confidentiality, Type, and C	Guideline	None: experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR: NR: fiber: NR Notes: NR		
Temperature	2	not reported		
System		not reported		
Standard Deviation Results		not reported		
Results Details		Reported as approximate value		
		1 11		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features physical/chemical properties or behaviors.
Domain 7: Test Palishil	ity,			
Domain 2. Test Kellauli	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Methe 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome
	Metric 4	Reliability/Analytical Method	Medium	Analytical method is unknown but is likely to be appropriate based on the data's inclu-
	metric 1.	Ternashing, Thaig teal Weatou	mourum	sion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other	36.1.5		· · ·	
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

\* Related References: NIOSH, 2016 cited but no other details available

HERO ID: 3860486 Table: 1 of 1

Study Citation: OECD Harmonized	(2017). PubChem: Vapor Pressure	Crocidolite.		
HERO ID:	3860486			
			EXTRACTIO	N
Parameter		Data		
V. D		о и		
Vapor Pressure		ca. 0 mm Hg		
Cashdantiality Type and C		Nanai apparimentali NB		
Connuentianty, Type, and C	and Stability	NOILE; experimental; NK		
Padialabel Source State a	nd Purity	ND ND ND ND ND Notes ND		
Temperature	nu i unity	NR, NR, NR, NR NOLES. NR		
System		NR		
Standard Deviation Results		NR		
Results Details		NR		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Peliabili	tx.			
Domain 2. 165t Kellaulii	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Methe 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
		5 5		inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other	34.5.5			
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

\* Related References: Citing OSHA Occupational Chemical DB and CAMEO Chemicals.

HERO ID: 192177 Table: 1 of 1

Study Citation: OECD Harmonized	NIOSH, (2007). Vapor Pressure	NIOSH pocket guide to chemical hazard	ls.				
HERO ID:	192177						
EXTRACTION							
Parameter		Data					
Vapor Pressure		0 - mm Hg					
CASRN and Test Material		1332-21-4; chrysotile, crocidolite, or amosite					
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR					
Temperature		NR					
System		NR					
Standard Deviation Results		NR	NR				
Results Details		approximate value					
				AT			
Domain		Metric	Rating	Comments			
Domain 1: Substance		Wette	Rating	connients			
Domain 1. Substance	Metric 1.	Representativeness	High	Data are measured for the subject chemical substance			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.			
Domain 3: Other							
	Metric 5:	Databases	Medium	The data are from a source that is known but is missing elements required for High designation such as peer-review, public availability, or the inclusion of references to original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Quality Determination</b>			High				

HERO ID: 3974865 Table: 1 of 1

Study Citation: OECD Harmonized	NIOSH, (2016). NIOSH pocket guide to chemical hazards: Asbe d Vapor Pressure			
HERO ID:	3974865			
			EXTRACTION	
Parameter		Data		
Vapor Pressure		ca. 0 - mm Hg		
CASRN and Test Material		1332-21-4; Asbestos		
Confidentiality, Type, and C	Guideline	None; Not specified; NR		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR		
Temperature		NR		
System		NR		
Standard Deviation Results		NR		
Results Details		Approximate value.		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features and/or other physical/chemical properties.
Domain 2: Test Reliability				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	Medium	The data are from a source that is known but is missing elements required for High designation such as peer-review, public availability, or the inclusion of references to original sources.
	Metric 6:	Models	N/A	Not applicable. Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			Medium	

\* Related References: None cited.
PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Vapor Pressure

HERO ID: 9109830 Table: 1 of 1

Study Citation: OECD Harmonized	NIOSH, (2019). N Vapor Pressure	NOSH pocket guide to chemical hazards	: Asbestos.		
Template:	1				
HERO ID:	9109830				
			EXTRACTIO	N	
Parameter		Data			
Vapor Pressure		ca 0 mm Hg			
CASRN and Test Material		1332-21-4; Actinolite, Actinolite asbestos Tremolite, Tremolite asbestos	, Amosite (cumm	ningtonite-grunerite), Anthophyllite, Anthophyllite asbestos, Chrysotile, Crocidolite (Riebeckite),	
Confidentiality, Type, and C	Buideline	none; not specified; not specified			
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR	1 .1. /		
Radiolabel, Source, State, a	diolabel, Source, State, and Purity NR; NR; NR Notes: Hydrated mineral silicates				
System		Not Reported			
System Standard Deviation Results		Not Reported			
Results Details		approximate			
Results Details		approximate			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance			0		
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or other physical/chemical properties.	
Domain 2: Test Reliabili	ty				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 2. Other					
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	y Determina	ation	High		

\* Related References: Primary reference not reported in this secondary source.

Study Citation: OECD Harmonized	ATSDR, (2001). T Water Solubility	oxicological profile for asbestos (Upda	te, September 20	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Water Solubility		insoluble -		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and G	Buideline	none; not specified; not specified		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and	nd Purity	NR; NR; NR; NR Notes: NR		
Temperature		not specified		
System		not specified		
pН		not specified		
Results Details Method		not specified		
Standard Deviation Results		not specified		
Results Details		Insoluble in water; insoluble in organic s	olvents; solubility	in acids: 56.00% loss in weight due to loss of counter-ions, silicate structure remains
		intact; solubility in bases: 1.03% loss in v	veight due to loss of	of counter-ions, silicate structure remains infact.
Damain		Matui -	EVALUATION	N Commente
Domain		Metric	Rating	Comments
Domain I: Substance	34.1.1	D	TT: 1	
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	tv			
2 onium 2. Test Rendulli	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Metric 5.	(Method Objectivity)	Wiedfulli	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was
				used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
				peer-reviewed by experts in the field, are broadly available to the public for review and
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Oualit</b>	v Determina	ation	High	
	<i>J</i> = 0000 mm		8	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Water Solubility

Study Citation: OECD Harmonized	ATSDR, (2001). T Water Solubility	oxicological profile for asbestos (Upda	te, September 20	001).		
HERO ID:	786664					
			EXTRACTIO	 N		
Parameter		Data				
Water Solubility		insoluble -				
CASRN and Test Material		12001-28-4; crocidolite				
Confidentiality, Type, and C	Juideline	none; not specified; not specified				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR				
Temperature		not specified				
System		not specified				
pH		not specified				
Results Details Method		not specified				
Standard Deviation Results		not specified				
Results Details		Insoluble in water; insoluble in organic s	solvents; solubility	in acids: 3.14% loss in weight due to loss of counter-ions, silicate structure remains		
		intact, solubility in bases. 1.20% loss in v	weight due to loss	of counce-ions, sincate structure remains infact.		
			FVAL HATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance			0			
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabili	ty					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)	_	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was		
				ustu.		
Domain 3. Other						
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are		
			8	peer-reviewed by experts in the field, are broadly available to the public for review and		
				use.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
			TT! ~ŀ			
Overall Qualit	y Determina		нign			

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Water Solubility

HERO ID: 786664 Table: 3 of 5

Study Citation: OECD Harmonized	ATSDR, (2001). 7 Water Solubility	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001). Water Solubility			
HERO ID:	786664				
			EXTRACTIO	 N	
Parameter		Data			
Water Solubility CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Temperature System pH Results Details Method Standard Deviation Results Results Details	Guideline e, and Stability nd Purity	insoluble - 12172-73-5; amosite none; not specified; not specified NR; NR; NR; NR NR; NR; NR Notes: NR not specified not specified not specified not specified not specified Insoluble in water: insoluble in organic	solvents: solubility	in acids: 12.00% loss in weight due to loss of counter-ions, silicate structure remains	
		intact; solubility in bases: 6.82% loss in	EVAL LIATION	of counter-ions, silicate structure remains intact.	
Domain		Metric	Rating	Comments	
Domain 1: Substance			8		
	Metric 1: Metric 2:	Representativeness Appropriateness	High High	Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.	
Domain 3: Other	M 5	D. ( )			
	Metric 5:	Databases	Hıgh	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Quality Determination High					

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Water Solubility

HERO ID: 786664 Table: 4 of 5

Study Citation:	ATSDR, (2001). 7	Foxicological profile for asbestos (Update	e, September 20	001).	
OECD Harmonized	Water Solubility				
Template:					
HERO ID:	786664				
		]	EXTRACTIO	N	
Parameter		Data			
Water Solubility		insoluble -			
CASRN and Test Material		14567-73-8; tremolite			
Confidentiality, Type, and C	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR			
Temperature		not specified			
System		not specified			
pH Describe Details Mathed		not specified			
Results Details Method		not specified			
Standard Deviation Results		not specified	vento		
Results Details		insoluble in water, insoluble in organic sol	vents.		
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Pelishili	its7				
Domain 2. Test Kellaulii	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	Metric 5.	(Method Objectivity)	Wiedrum	towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.	
Domain 3: Other		<b>D</b> . 1			
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and	
				use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	Overall Quality Determination High				

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Water Solubility

Study Citation: OECD Harmonized	ATSDR, (2001). T Water Solubility	oxicological profile for asbestos (Upda	te, September 20	001).			
HERO ID:	786664						
			EXTRACTIO	 N			
Parameter		Data					
Water Solubility		insoluble -					
CASRN and Test Material		17068-78-9; anthophyllite					
Confidentiality, Type, and C	Juideline	none; not specified; not specified					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR					
Temperature		not specified					
System		not specified					
pH		not specified					
Results Details Method		not specified					
Standard Deviation Results		not specified					
Results Details		Insoluble in water; insoluble in organic s	solvents; solubility	in acids: 2.13% loss in weight due to loss of counter-ions, silicate structure remains			
		intact, solubility in bases. 1.77% loss in v	weight due to loss	of counce-ions, sincate structure remains infact.			
			FVAL HATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance			0				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabili	ty						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)	_	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was			
				u300.			
Domain 3: Other							
Domain of Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are			
			6	peer-reviewed by experts in the field, are broadly available to the public for review and			
				use.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Ovell4	. Dotomin	ation	Uiak				
Overan Quant	y Determina		nigh				

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Water Solubility

HERO ID: 3860485 Table: 1 of 1

Study Citation:	(2017). PubChen	n: Chrvsotile.		
<b>OECD</b> Harmonized	Water Solubility			
Template:	<b>2</b> 2 4 2 <b>2</b>			
HERO ID:	3860485			
_			EXTRACTION	
Parameter		Data		
Water Solubility		Not Reported		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	none; experimental; not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Temperature		25C		
System		dissolution of chrysotile in water		
pН		not reported		
Results Details Method		continuous extraction		
Standard Deviation Results		Not Reported		
Results Details		activity product of chrysotile in water = 1	IE-51.0	
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	Medium	Measured data are consistent with the subject chemical substance structural features; however standard water solubility was not assessed.
Domain 2: Test Reliabil	ity			
Bollan 2. Test Kellabil	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	moule 5.	(Method Objectivity)	medium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
	weute J.	Databases	Ingu	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determin	ation	Medium	

\* Related References: Callahan, M.A., M. W. Slimak, N. W. Gabel, et al. Water-Related Environmental Fate of 129 Priority Pollutants. Volume I. EPA-440/4 79-029a. Washington, DC: U.S. Environmental Protection Agency, December 1979., p. 7-8

Page 331 of 522

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Water Solubility

HERO ID: 3860486 Table: 1 of 1

Study Citation:	(2017). PubChem	: Crocidolite.
<b>OECD</b> Harmonized	Water Solubility	
Template:	5	
HERO ID:	3860486	
		EXTRACTION
Parameter		Data
Water Solubility		insoluble in water
CASRN and Test Material		12001-28-4; crocidolite
Confidentiality, Type, and	Guideline	none; experimental; not reported
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR
Radiolabel, Source, State,	and Purity	NR; NR; solid; NR Notes: NR
Temperature	•	NR
System		NR
pH		NR
Results Details Method		NR
Standard Deviation Results	8	NR
Results Details		NR

	EVALUATION					
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabi	ility					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

\* Related References: Citing CAMEO Chemicals and ILO-ICSC.

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Water Solubility

HERO ID: 3975020 Table: 1 of 1

Study Citation: OECD Harmonized	USGS, (2002). As Water Solubility	JSGS, (2002). Asbestos: Geology, mineralogy, mining, and uses. Vater Solubility				
Template:	-					
HERO ID:	3975020					
			EXTRACTIO	N		
Parameter		Data				
Water Solubility		Not Reported				
Confidentiality, Type, and C	luideline	None: Experimental: NR				
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR				
Temperature		NR				
System		NR				
pН		NR				
Results Details Method		NR				
Standard Deviation Results		Not Reported				
Results Details		After prolonged exposure to water, espec later of chrysotile fibers will dissolve and	cially at high temper d increase the pH of	ratures, slow progressive leaching of metal and silicate components occurs. The brucite f the solution. The equilibrium pH for the aqueous chrysotile slurry is 10.0 - 10.5.		
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features (e.g., presence of certain functional groups) and/or other physical/chemical properties.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	y Determina	ation	High			

\* Related References: Cites S. Speil and J. P. Leinerveber, Environ. Res. 2(3), 166 (1969). HEROID 5353620

Page 333 of 522

Study Citation: OECD Harmonized	Anonymous (198 Refractive Index	89). NIOSH Manual of Analytical Me	thods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.	
HERO ID:	3647242				
			EXTRACTIO	N	
Parameter		Data			
Refractive Index		1.54 - 1.55			
CASRN and Test Material		12001-29-5; chrysotile			
Confidentiality, Type, and C	suideline	ND, ND, ND, ND			
Padiolabel Source State	nd Purity	NR, NR, NR, NR None: NP: fiber: NP			
Temperature	na i unity	Not Reported			
System		Not Reported			
Standard Deviation Results		Not Reported			
Results Details		Not Reported			
Results Details Methods		Not Reported			
Parameter		Not Reported			
			EVALUATIO	Ň	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or other physical/chemical properties.	
Domain 2 <sup>.</sup> Test Reliabili	tv				
2 sinuin 2. Tost Ronuolii	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 3: Other	Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field and are broadly available to the public for review.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Quality Determination High				

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 3647242 Table: 2 of 6

Study Citation: OECD Harmonized	Anonymous (198 Refractive Index	9). NIOSH Manual of Analytical Method	s, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.
HERO ID:	3647242			
		I	EXTRACTIO	N
Parameter		Data		
Refractive Index		1.70 - 1.71		
CASRN and Test Material		12001-28-4; crocidolite		
Confidentiality, Type, and G	duideline	none; experimental; not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and	nd Purity	None; NR; fiber; NR Notes: riebeckite		
Temperature		Not Reported		
System		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
Results Details Methods		Not Reported		
Parameter		Not Reported		
		]	EVALUATION	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or
				other physical/chemical properties.
Domain 2: Tast Daliahili	<b>t</b> x,			
Domain 2. Test Kenadin	Notria 3:	Paliability/Unbiased	Madium	There is no indication that the methodology for producing the information was biased
	Meure J.	(Method Objectivity)	Wiedium	towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field and are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination				

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 3647242 Table: 3 of 6

Study Citation: OECD Harmonized	Anonymous (19 Refractive Index	89). NIOSH Manual of Analytical Method	ls, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.
HERO ID:	3647242			
			EXTRACTIO	N
Parameter		Data		
Refractive Index		1.67 - 1.70		
CASRN and Test Material		12172-73-5; cummingtonite-grunerite		
Confidentiality, Type, and C	Guideline	none; experimental; not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	None; NR; fiber; NR Notes: amosite		
Temperature		Not Reported		
System		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
Results Details Methods		Not Reported		
Parameter		Not Reported		
D .			EVALUATION	N
Domain		Metric	Rating	Comments
Domain 1: Substance	M ( 1		TT: 1	
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or other physical/chemical properties
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
				1
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field and are broadly available to the public for review.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 3647242 Table: 4 of 6

Study Citation: OECD Harmonized	Anonymous (19 Refractive Inde	989). NIOSH Manual of Analytical Meth x	ods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.
HERO ID:	3647242			
			EXTRACTIO	N
Parameter		Data		
Refractive Index		1.61 - 1.63		
CASRN and Test Material		17068-78-9; anthophyllite		
Confidentiality, Type, and C	Guideline	none; experimental; not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	None; NR; fiber; NR		
Temperature		Not Reported		
System		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
Results Details Methods		Not Reported		
Parameter		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance			0	
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features or
				other physical/chemical properties.
Domain 2: Test Reliabil	ity			
Domain 2. Test Kellauli	Metric 3	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	metric 5.	(Method Objectivity)	meanan	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 2. Other				
Domain 5: Other	Metric 5.	Databases	Uigh	The information or data is from a recognized data collection/repository where data are
	wieure J.	DataUases	Ingli	peer-reviewed by experts in the field and are broadly available to the public for review
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	High	
	-		3	

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 3647242 Table: 5 of 6

Study Citation: OECD Harmonized	Anonymous (19 Refractive Inde	989). NIOSH Manual of Analytical Meth x	ods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.	
HERO ID:	3647242				
			EXTRACTIO	N	
Parameter		Data			
Refractive Index CASRN and Test Material Confidentiality, Type, and G Solvent, Reactivity, Storage Radiolabel, Source, State, a	Guideline e, and Stability and Purity	1.60 - 1.64 14567-73-8; tremolite none; experimental; not reported NR; NR; NR; NR None; NR; fiber; NR			
Temperature	-	Not Reported			
System Standard Deviation Results Results Details	;	Not Reported Not Reported Not Reported			
Results Details Methods		Not Reported			
Parameter		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance	Madaia 1.	D	TT: _1.		
	Metric 1: Metric 2:	Appropriateness	High	Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features or	
			8	other physical/chemical properties.	
Domain 2. Test Reliabil	ity				
Domain 2. 103t Kellabil	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 3: Other	Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field and are broadly available to the public for review.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	ty Determi	nation	High		

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 3647242 Table: 6 of 6

Study Citation: OECD Harmonized	Anonymous (19 Refractive Inde	989). NIOSH Manual of Analytical Met x	hods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.
Template:	2647242			
HERO ID:	3647242			
<b>D</b> (			EXTRACTIO	N
Parameter		Data		
Refractive Index		1.62 - 1.68		
CASRN and Test Material		13768-00-8: actinolite		
Confidentiality, Type, and C	Guideline	none: experimental: not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	und Purity	None; NR; fiber; NR		
Temperature		Not Reported		
System		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
Results Details Methods		Not Reported		
Parameter		Not Reported		
D .			EVALUATIO	N C C
Domain		Metric	Rating	Comments
Domain 1: Substance	Matria 1	Barragantativanaga	Uich	Data are managered on estimated for the sphilast chemical sphetones
	Metric 1: Metric 2:	Appropriateness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2.	Appropriateness	Ingn	other physical/chemical properties.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Matria 4	(Method Objectivity) Reliability/A polytical Mathod	Madium	towards a particular product or outcome.
	Metric 4.	Kenability/Analytical Method	Wedium	inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other	Matria 5.	Detahagag	High	
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are neer-reviewed by experts in the field and are broadly available to the public for review
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Auglity Determination				
	y Determin		ingn	

Impact: HERO ID:       B227307         Parameter       Data         Refractive Index       L.61         CASRN and Test Material       77556-67.57. Anthophylline         Confidentiality, Type, and Guideline       None: Experimental: Nor reported         Solven, Reactivity, Storage, and Stability       NR; NR; NR: NR         Reflocitive, State, and Puriry       NR; NR; NR: NR         Not Reported       Solven, Reactivity, Storage, and Stability         System       Not Reported         Standard Deviation Results       Not Reported         Parameter       Not Reported         Parameter       Not Reported         Domain       Metric 1:       Representativeness         Domain 1: Substance       Metric 2:       Appropriateness       NVA         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased       Medium         Metric 4:       Reliability/Analytical Method       Medium       There is no indication that the methodology for producing the information.         Domain 3: Other       Metric 5: <th>Study Citation: OECD Harmonized</th> <th>Badollet, M. S. ( Refractive Index</th> <th>1951). Asbestos, a mineral of unparalle</th> <th>led properties. Transact</th> <th>tions, Canadian Institute of Mining and Metallurgy 54:151-160.</th>	Study Citation: OECD Harmonized	Badollet, M. S. ( Refractive Index	1951). Asbestos, a mineral of unparalle	led properties. Transact	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
Parameter         Data           Refractive Index         1.61           CASRN and Test Material         7735-67-53. Anthophyllite           Confidentiality, Type, and Guideline         None: Experimental: Not reported           Solvent, Reactivity, Storage, and Stability         NR: NR: NR: NR           Radiolable, Source, State, and Purity         NR: NR: NR: NR           Madiolable, Source, State, and Purity         NR: NR: NR: NR           Madiolable, Source, State, and Purity         NR: NR: NR: NR           System         Not Reported           System         Not Reported           Results Details Methods         Not Reported           Results Details Methods         Not Reported           Parameter         Not Reported           Domain         Metric         Rating           Domain 1: Substance         Metric         Reported           Metric 2:         Appropriateness         N/A         Rating of this factor is not applicable to this kind of information.           Domain 2: Test Reliability         Metric 4:         Reliability/Unbiased (Method Objectivity)         Medium         There is no indication that the methodology for producing the information.           Domain 3: Other         Metric 5:         Databuses         N/A         Rating of this factor is not applicable to this kind of informatio	HERO ID:	3827307			
Parameter       Data         Refractive Index       1.61         CASRN and Test Material       7536-67.57, Anthophyllite         Condituriality, Type, and Guideline       None: Experimental: Nor teported         Solvent, Reactivity, Storage, and Subility       NR: NR: NR: NR         Radiolabel, Source, State, and Purity       NR: NR: NR: NR         Radiolabel, Source, State, and Purity       NR: NR: NR: NR         System       Not Reported         System       Not Reported         System       Not Reported         Standard Deviation Results       Not Reported         Results Details Methods       Not Reported         Parameter       Not Reported         Parameter       Not Reported         Nomain 1: Substance       Metric 1:         Metric 2:       Appropriateness         Noter 2:       Reported         Notic 2:       Reported         Noter 2:       Not Reported         Noter 2:       Not Reported         Noter 2:       Not Reported         Parameter       Noter 2:         Noter 2:       Noter 2:         Noter 2:       Restrict 2:         Metric 2:       Appropriateness         N/A       Ratago of this factor is n				EXTRACTION	
Refractive Index 1.61 CASRN and Test Material 77536-67-5; Anthophyllite Condinuility, Type, and Cuideline None: Experimental; Not reported Solvent, Reactivity, Storage, and Stability NR; NR; NR Radiolabel; Source, State, and Puriy NR; NR; NR; RR Radiolabel; Source, State, and Puriy NR; NR; NR; NR; RR Radiolabel; Source, State, and Puriy NR; NR; NR; NR; NR; RR Radiolabel; Detaility/Analytical Method Medium There is no indication that the methodologe for producing the information was biased tore and purice is in a per-reviewed/recognized database or other secondary source. Pomain 3; Other Metric 4: Reliability/Analytical Method Medium N/A Rating of this factor is not applicable to this kind of information. N/A Rating of this factor is not applicable to this kind of information. Rating of this factor is not applicable to this kind of information. N/A Rating of this factor is not applicable to this kind of information. N/A Rating of this factor is not applicable to this kind of information. N/A Rating of this factor is not applicable to this kind of information. N/A Rating of this factor is not applicable to this	Parameter		Data		
Refractive Index       1.61         CASRN and Test Material       77536-67-5; Anthophyllite         Confidentiality, Type, and Guideline       None: Experimental; Not reported         Solvent, Reactivity, Storage, and Stability       NR: NR; NR; NR         Radiobabb, Source, State, and Purity       Not Reported         System       Not Reported         System       Not Reported         Standard Deviation Results       Not Reported         Standard Deviation Results       Not Reported         Results Details Methods       Not Reported         Parameter       Not Reported         Parameter       Not Reported         Parameter       Not Reported         Domain 1: Substance       Metric 1:         Metric 2:       Appropriateness         Not Reported       No/A         Rating       Comments         Domain 1: Substance       Metric 1:         Metric 2:       Appropriateness         N/A       Rating of this factor is not applicable to this kind of information.         Domain 2: Test Reliability/       Method Objectivity)         Metric 4:       Reliability/Analytical Method         Metric 5:       Databases       N/A         Rating of this factor is not applicable to this kind of informat					
CASRN and Test Material 7753-67-5; Authophyllite 75; Authophyllite 75; Authophyllite 75; Authophyllite 75; Authophyllite 75; Databases N/A Rating of this factor is not applicable to this kind of information. 10/10/10/10/10/10/10/10/10/10/10/10/10/1	Refractive Index		1.61		
Condientiality, Type, and Guideline None: Experimental; Not reported Solvent, Reactivity, Storage, and Stability NR: NR: NR, NR, NR Radiolabel, Source, State, and Stability NR: NR: NR: NR: NR Temperature Not Reported System Not Reported System Not Reported Standard Deviation Results Not Reported Results Details Methods Not Reported Results Details Methods Not Reported Not Report	CASRN and Test Material		77536-67-5; Anthophyllite		
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Vurity NR; NR; NR; NR Temperature Not Reported Standard Deviation Results Mot Reported Standard Deviation Results Not Reported Results Details Methods Not Reported Results Details Methods Not Reported Parameter Not Reported Parameter Not Reported Parameter Not Reported Parameter Not Reported Metric 1: Representativeness High Data are measured for the subject chemical substance. Metric 2: Appropriateness N/A Rating of this factor is not applicable to this kind of information. Metric 4: Reliability/Analytical Method Not Reported Needure States N/A Rating of this factor is not applicable to this kind of information. Metric 4: Databases N/A Rating of this factor is not applicable to this kind of information. Metric 5: Databases N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Databases N/A Rating of this factor is not applicable to this kind of information. Metric 6: Databases N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of th	Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Radiolabel, Source, State, and Purity NR; NR; NR; NR, NG Reported System Not Reported Standard Deviation Results Not Reported Results Details Methods Not Reported Parameter Not Reported Parameter Not Reported Pomain 1: Substance Metric 1: Representativeness High Data are measured for the subject chemical substance. Metric 2: Appropriateness N/A Rating of this factor is not applicable to this kind of information. Metric 4: Reliability/Unbiased (Method) Metric 5: Databases N/A Rating of this factor is not applicable to this kind of information. Metric 5: Databases N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information. Metric 6: Models N/A Rating of this factor is not applicable to this kind of information.	Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Temperature       Not Reported         System       Not Reported         Standard Deviation Results       Not Reported         Results Details       Not Reported         Results Details Methods       Not Reported         Parameter       Not Reported         Domain       Metric         Results Details       Reported         Metric       Reported         Parameter       Not Reported         Domain 1: Substance       Metric 1:         Metric 2:       Appropriateness         Metric 2:       Appropriateness         Noter 2:       Reliability/Unbiased (Method Objectivity)         Metric 4:       Reliability/Analytical Method         Metric 4:       Reliability/Analytical Method         Metric 5:       Databases         N/A       Rating of this factor is not applicable to this kind of information.         Domain 3: Other       Metric 5:         Metric 5:       Databases         N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models         N/A       Rating of this factor is not applicable to this kind of information.	Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
System       Not Reported         Standard Deviation Results       Not Reported         Results Details       Not Reported         Results Details Methods       Not Reported         Parameter       Not Reported         Domain       Metric         Results Details       Not Reported         Domain 1: Substance       Metric 1:         Metric 2:       Appropriateness         Metric 2:       Appropriateness         Not Reported       Not Reported         Domain 1: Substance       Metric 2:         Metric 2:       Repropriateness         N/A       Rating of this factor is not applicable to this kind of information.         Domain 2: Test Reliability       Metric 3:         Metric 4:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Temperature		Not Reported		
Standard Deviation Results       Not Reported         Results Details Methods       Not Reported         Parameter       Not Reported         Domain       Metric Reported         Domain 1: Substance       Metric         Metric 1:       Representativeness         Metric 2:       Appropriateness         Not Reported       Not Reported         Domain 1: Substance       Metric 2:         Metric 2:       Reported         Metric 2:       Reported         Metric 4:       Reliability/Unbiased (Method Objectivity)         Metric 4:       Reliability/Analytical Method         Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       Medium         Domain 3: Other       Metric 5:       Databases         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	System		Not Reported		
Results Details       Not Reported         Results Details Methods       Not Reported         Parameter       Not Reported         Domain       Metric         Results Domain 1: Substance       Representativeness         Metric 1:       Representativeness         Metric 2:       Appropriateness         Metric 2:       Appropriateness         Metric 3:       Reliability/Unbiased (Method Objectivity)         Metric 4:       Reliability/Analytical Method         Metric 5:       Databases         Metric 5:       Databases         Metric 6:       Models         Metric 6:       Models	Standard Deviation Results		Not Reported		
Results Details Methods Parameter       Not Reported Not Reported         Domain       Metric       EVALUATION Rating       Comments         Domain 1: Substance       Metric 1:       Representativeness       High Metric 2:       Data are measured for the subject chemical substance. Metric 2:       Appropriateness         Domain 2: Test Reliability/ Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium (Method Objectivity)       There is no indication that the methodology for producing the information was biased towards a particular product or outcome. The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information. Metric 6:         Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information. N/A         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information. Rating of this factor is not applicable to this kind of information.	Results Details		Not Reported		
Parameter       Not Reported         Domain       Metric       EVALUATION Rating       Comments         Domain 1: Substance       Metric 1:       Representativeness       High Metric 2:       Data are measured for the subject chemical substance.         Metric 2:       Appropriateness       N/A       Rating of this factor is not applicable to this kind of information.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Metrid Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Results Details Methods		Not Reported		
Domain       Metric       EVALUATION Rating       Comments         Domain 1: Substance       Metric 1:       Representativeness       High Metric 2:       Data are measured for the subject chemical substance. Metric 2:       Representativeness       High N/A       Data are measured for the subject chemical substance. Rating of this factor is not applicable to this kind of information.         Domain 2: Test Reliability Metric 3:       Reliability/Unbiased (Method Objectivity) Reliability/Analytical Method       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.	Parameter		Not Reported		
EVALUATION         Domain       Metric       Rating       Comments         Domain 1: Substance       Metric 1:       Representativeness       High       Data are measured for the subject chemical substance.         Metric 2:       Appropriateness       N/A       Rating of this factor is not applicable to this kind of information.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.					
Domain     Metric     Rating     Comments       Domain 1: Substance     Metric 1:     Representativeness     High     Data are measured for the subject chemical substance.       Metric 2:     Appropriateness     N/A     Rating of this factor is not applicable to this kind of information.       Domain 2: Test Reliability     Metric 3:     Reliability/Unbiased (Method Objectivity)     Medium     There is no indication that the methodology for producing the information was biased towards a particular product or outcome.       Metric 4:     Reliability/Analytical Method     Medium     The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.       Domain 3: Other     Metric 5:     Databases     N/A     Rating of this factor is not applicable to this kind of information.       Metric 6:     Models     N/A     Rating of this factor is not applicable to this kind of information.				EVALUATION	
Domain 1: Substance       Metric 1:       Representativeness       High       Data are measured for the subject chemical substance.         Metric 2:       Appropriateness       N/A       Rating of this factor is not applicable to this kind of information.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       Medium       The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Overall Ouality Determination       Medium       N/A       Rating of this factor is not applicable to this kind of information.	Domain		Metric	Rating	Comments
Metric 1:       Representativeness       High Metric 1:       Data are measured for the subject chemical substance.         Metric 2:       Appropriateness       N/A       Rating of this factor is not applicable to this kind of information.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       Medium       The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Overall Ouality Determination       Medium       Medium       N/A	Domain 1: Substance				
Metric 2:       Appropriateness       N/A       Rating of this factor is not applicable to this kind of information.         Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Overall Ouality Determination       Medium       Medium		Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
Domain 2: Test Reliability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Overall Ouality Determination       Medium       Medium		Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Test Kenability       Metric 3:       Reliability/Unbiased (Method Objectivity)       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Metric 4:       Reliability/Analytical Method       Medium       There is no indication that the methodology for producing the information was biased towards a particular product or outcome.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Overall Ouality Determination       Medium       Medium	Domain 2: Tast Daliahili	4			
Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Overall Ouality Determination       Medium       Medium	Domain 2. Test Kenaum	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
Metric 4:       Reliability/Analytical Method       Medium       The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.         Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Overall Ouality Determination       Medium		Meure 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome
Domain 3: Other     Metric 5:     Databases     N/A     Rating of this factor is not applicable to this kind of information.       Overall Ouality Determination     Medium		Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
Domain 3: Other       Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Overall Ouality Determination       Medium					inclusion in a peer-reviewed/recognized database or other secondary source.
Metric 5:       Databases       N/A       Rating of this factor is not applicable to this kind of information.         Metric 6:       Models       N/A       Rating of this factor is not applicable to this kind of information.         Overall Ouality Determination       Medium	Domain 3 <sup>,</sup> Other				
Metric 6:     Models     N/A     Rating of this factor is not applicable to this kind of information.       Overall Ouality Determination     Medium	2 childin 5. Outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information
Overall Quality Determination Medium		Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination Medium		incure o.		1.1/1 1	rading of this factor is not approable to this kind of information.
	<b>Overall Qualit</b>	y Determin	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. Refractive Inde	(1951). Asbestos, a mineral of unparall x	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
Defrective Index		1.62		
CASEN and Test Material		77536-66-4: Actinolite		
Confidentiality Type and	Guideline	None: Experimental: Not reported		
Solvent Reactivity Storage	e and Stability	NR·NR·NR·NR		
Radiolabel Source State	and Purity	NR: NR: NR: NR		
Temperature	and Fully	Not Reported		
System		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Weakly pleochroic		
Results Details Methods		Not Reported		
Parameter		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance		incure	Ituing	connicits
Domain 1. Substance	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
				<b>3 1 1 1</b>
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 2: Other				
Domain 5: Other	Matria 5:	Databases	NT/A	Dating of this factor is not applicable to this kind of information
	Metric 5: Matria 6:	Madala	N/A N/A	Rating of this factor is not applicable to this kind of information.
	wietric 0:	wouels	IN/A	kaning of this factor is not applicable to this kind of information.
<b>Overall Ouali</b>	t <b>v Determi</b>	nation	Medium	
	v			

Study Citation: OECD Harmonized	Badollet, M. S. Refractive Inde	(1951). Asbestos, a mineral of unparall x	eled properties. Transac	ctions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
Refractive Index		1.50 - 1.55		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Temperature	-	Not Reported		
System		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
Results Details Methods		Not Reported		
Parameter		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Palishil	ity.			
Domain 2. Test Kellauli	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Wieure 5.	(Method Objectivity)	Wedium	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
Domain 5. Outer	Metric 5	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6	Models	N/A	Rating of this factor is not applicable to this kind of information.
	incure 0.		11/11	rading of this factor is not approache to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	Medium	

Study Citation: OECD Harmonized Template:	Badollet, M. S. Refractive Inde	(1951). Asbestos, a mineral of unparall x	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
Defractive Index		1.64		
CASEN and Test Material		1.04 12172-73-5: Amosite		
Confidentiality Type and (	Guideline	None: Experimental: Not reported		
Solvent Reactivity Storage	and Stability	NR· NR· NR		
Radiolabel Source State	and Purity	NR· NR· NR		
Temperature	and I unity	Not Reported		
System		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
Results Details Methods		Not Reported		
Parameter		Not Reported		
<b>D</b>			EVALUATION	C
Domain		Metric	Rating	Comments
Domain 1: Substance			TT' 1	
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
Domain 5. Outer	Metric 5	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. Refractive Inde	(1951). Asbestos, a mineral of unparall x	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
Refractive Index		17		
CASRN and Test Material		12001-28-4: Crocidolite		
Confidentiality Type and (	Guideline	None: Experimental: Not reported		
Solvent, Reactivity, Storage	e and Stability	NR: NR: NR		
Radiolabel, Source, State, a	and Purity	NR: NR: NR		
Temperature	and I alloy	Not Reported		
System		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Pleochroic		
Results Details Methods		Not Reported		
Parameter		Not Reported		
			<b>EVALUATION</b>	
Domain		Metric	Rating	Comments
Domain 1: Substance			6	
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
2 childin 2. Guidi	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. Refractive Inde	(1951). Asbestos, a mineral of unparall x	eled properties. Transac	ctions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
Refractive Index		1.61		
CASRN and Test Material		77536-68-6: Tremolite		
Confidentiality, Type, and	Guideline	None: Experimental: Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR: NR: NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Temperature	,	Not Reported		
System		Not Reported		
Standard Deviation Results	6	Not Reported		
Results Details		Not Reported		
Results Details Methods		Not Reported		
Parameter		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
	•,			
Domain 2: Test Kellabil	Ily Matria 2:	Poliability/Unbiased	Madium	There is no indication that the methodology for any during the information of the line
	Metric 5:	(Method Objectivity)	Medium	towards a particular product or outcome
	Metric 4.	(Method Objectivity) Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
	Medie 1.	Kennomey// maryteen Weenou	Weddulli	inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3. Other				
2 childin 51 Other	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	Medium	

Study Citation:	Bailey, K. F., Kels pictorial presentati	Bailey, K. F., Kelse, J., Wylie, A. G., Lee, R. J. (2006). The asbestiform and prismatic mineral growth habit and their relationship to cancer studies: A pictorial presentation.				
OECD Harmonized	Refractive Index					
Template:						
HERO ID:	785518					
		EXTRACTION				
Parameter		Data				
Refractive Index		ca. 1.70 (parallel to elongation) - ca. 1.71 (perpendicular to elongation)				
CASRN and Test Material		12001-28-4; Crocidolite				
Confidentiality, Type, and C	Guideline	none; not specified; not specified				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; fibers; NR Notes: NR				
Temperature	-	NR				
System		NR				
Standard Deviation Results	5	NR				
Results Details		NR				
Results Details Methods		NR				
Parameter		NR				

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			Medium	

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

Study Citation:	Bailey, K. F., Ke	Bailey, K. F., Kelse, J., Wylie, A. G., Lee, R. J. (2006). The asbestiform and prismatic mineral growth habit and their relationship to cancer studies: A nictorial presentation			
OECD Harmonized	Refractive Index				
Template: HERO ID:	785518	85518			
	EXTRACTION				
Parameter		Data			
Refractive Index CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Temperature System Standard Deviation Results Results Details Results Details Methods Parameter	Guideline e, and Stability and Purity	ca. 1.54 (parallel to elongation) - ca. 1.5 12001-29-5; Chrysotile-asbestos none; not specified; not specified NR; NR; NR; NR NR; NR; fibers; NR Notes: NR not reported not reported not reported not reported not reported not reported	5 (perpendicular to elong	ation)	
			EVALUATION		
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1: Matria 2:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	Fign	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	Low	towards a particular product or outcome. The analytical method is unknown and there is no indication that a reliable method was used.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Quali</b>	ty Determin	nation	Medium		

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

Study Citation:	Bailey, K. F., Ke	Bailey, K. F., Kelse, J., Wylie, A. G., Lee, R. J. (2006). The asbestiform and prismatic mineral growth habit and their relationship to cancer studies: A pictorial presentation			
<b>OECD Harmonized</b>	Refractive Index				
Template: HERO ID:	785518	/85518			
			EXTRACTION		
Parameter		Data			
Refractive Index CASRN and Test Material Confidentiality, Type, and G Solvent, Reactivity, Storage Radiolabel, Source, State, a Temperature System Standard Deviation Results Results Details Results Details Methods Parameter	Guideline e, and Stability and Purity	<ul> <li>ca. 1.64-1.68 (parallel to elongation) - ca 77536-66-4; Actinolite</li> <li>none; not specified; not specified</li> <li>NR; NR; NR; NR</li> <li>NR; NR; fibers; NR Notes: NR</li> <li>not reported</li> </ul>	a. 1.62-1.67 (perpendicula	ur to elongation)	
		-			
Domain		Matria	EVALUATION	Commente	
Domain 1: Substance		Metric	Katilig	Comments	
	Metric 1: Metric 2:	Representativeness Appropriateness	High High	Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabil	ity				
	Metric 3: Metric 4:	Reliability/Unbiased (Method Objectivity) Reliability/Analytical Method	Medium Low	There is no indication that the methodology for producing the information was biased towards a particular product or outcome. The analytical method is unknown and there is no indication that a reliable method was used.	
Domain 3: Other					
	Metric 5: Metric 6:	Databases Models	N/A N/A	Rating of this factor is not applicable to this kind of information. Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	ty Determin	nation	Medium		

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 785518 Table: 4 of 5

Study Citation:	Bailey, K. F., Kel	Bailey, K. F., Kelse, J., Wylie, A. G., Lee, R. J. (2006). The asbestiform and prismatic mineral growth habit and their relationship to cancer studies: A pictorial presentation			
<b>OECD Harmonized</b>	Refractive Index				
Template:					
HERO ID:	785518				
			EXTRACTION		
Parameter		Data			
Refractive Index		ca. 1.61 - ca. 1.63			
CASRN and Test Material		77536-67-5; Anthophyllite-Asbestos			
Confidentiality, Type, and C	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	NR; NR; fibers; NR Notes: NR			
Temperature		not reported			
System		not reported			
Standard Deviation Results		not reported			
Results Details		not reported			
Results Details Methods		not reported			
Parameter		not reported			
			EVALUATION		
Domain		Metric	Rating	Comments	
Domain I: Substance		D			
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	y Determin	ation	Medium		

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

Study Citation:	Bailey, K. F., Ke	Bailey, K. F., Kelse, J., Wylie, A. G., Lee, R. J. (2006). The asbestiform and prismatic mineral growth habit and their relationship to cancer studies: A signature of the second presentation			
OECD Harmonized	Refractive Index				
Template: HERO ID:	785518	785518			
			EXTRACTION		
Parameter		Data			
Refractive Index CASRN and Test Material Confidentiality, Type, and O Solvent, Reactivity, Storage Radiolabel, Source, State, a Temperature System Standard Deviation Results Results Details Results Details Methods Parameter	Guideline e, and Stability and Purity	ca. 1.60-1.62 (perpendicular to elongatio 77536-68-6; Tremolite none; not specified; not specified NR; NR; NR; NR NR; NR; fibers; NR Notes: NR not reported not reported not reported not reported not reported not reported not reported not reported not reported	n) - ca. 1.62-1.64 (paralle	el to elongation)	
		not reported			
Domain		Metric	EVALUATION Rating	Comments	
Domain 1: Substance		Wethe	Rating	comments	
	Metric 1: Metric 2:	Representativeness Appropriateness	High High	Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features.	
Domain 2. Test Reliabil	ity				
Domain 2: Test Rendon	Metric 3: Metric 4:	Reliability/Unbiased (Method Objectivity) Reliability/Analytical Method	Medium Low	There is no indication that the methodology for producing the information was biased towards a particular product or outcome. The analytical method is unknown and there is no indication that a reliable method was	
		,,,,,		used.	
Domain 3: Other					
	Metric 5: Metric 6:	Databases Models	N/A N/A	Rating of this factor is not applicable to this kind of information. Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	ty Determi	nation	Medium		

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 7924810 Table: 1 of 4

Study Citation: OECD Harmonized	Elsevier, (2021). Refractive Index	Reaxys: physical-chemical property dat	ta for Chrysotile.		
Template:					
HERO ID:	7924810				
			EXTRACTIO	N	
Parameter		Data			
Refractive Index		1.545 - 1.553			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR			
Temperature		Not reported			
System		Not reported			
Standard Deviation Results		Not Reported			
Results Details		1 range for n(gamma) was reported in Re	eaxys.		
Results Details Methods		Not Reported			
Parameter		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Peliabili	<b>11</b> 7				
Domain 2. Test Kenaum	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	Metric 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's	
				inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 3: Other	Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Quality Determination High					

\* Related References: Selfrige, G. C.; American Mineralogist; vol. 21; (1936); p. 477

Asbestos

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 7924810 Table: 2 of 4

Study Citation: OECD Harmonized	Elsevier, (2021). Reaxys: physical-chemical property data for Chrysotile. Refractive Index				
HERO ID:	7924810				
			EXTRACTIO	N	
Parameter		Data			
Refractive Index		1.547 -			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and C	Buideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR			
Temperature		Not reported			
System		Not reported			
Standard Deviation Results		Not Reported		1 . (22.7	
Results Details		2 values for Ng were reported in Reaxys	; one value was me	asured at 422.7 nm.	
Results Details Methods		Not Reported			
Parameter		Not Reported			
			EVALUATION	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2 <sup>.</sup> Test Reliabili	tv				
2 chian 2. Test Renabili	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)	1110010111	towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 3: Other			TT: 1		
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	y Determin	ation	High		

\* Related References: Korytkova; Pivovarova; Drosdova; Gusarov; Russian Journal of General Chemistry; vol. 77; nb. 10; (2007); p. 1669 - 1676; Korytkova; Maslov; Pivovarova; Polegotchenkova; Povinich; Gusarov; Inorganic Materials; vol. 41; nb. 7; (2005); p. 743 - 749

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

Study Citation: OECD Harmonized	Elsevier, (2021) Refractive Index	. Reaxys: physical-chemical property dat	a for Chrysotile	
Template:				
HERO ID:	7924810			
			EXTRACTIO	N
Parameter		Data		
Pafractive Index		1 542		
CASRN and Test Material		1.042 - 12001-29-5: Chrysotile		
Confidentiality Type and (	Guideline	None: Experimental: Not reported		
Solvent Reactivity Storage	e and Stability	NR·NR·NR·NR		
Radiolabel, Source, State, a	and Purity	NR: NR: Solid: NR		
Temperature		Not reported		
System		Not reported		
Standard Deviation Results	5	Not Reported		
Results Details		2 values for $N(p)$ were reported in Reaxy	s.	
Results Details Methods		Not Reported		
Parameter		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
Domain 2. Test Kelldull	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Medie 5.	(Method Objectivity)	Wiedrum	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	

\* Related References: Korytkova; Pivovarova; Drosdova; Gusarov; Russian Journal of General Chemistry; vol. 77; nb. 10; (2007); p. 1669 - 1676; Korytkova; Maslov; Pivovarova; Polegotchenkova; Povinich; Gusarov; Inorganic Materials; vol. 41; nb. 7; (2005); p. 743 - 749

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 7924810 Table: 4 of 4

Study Citation: OECD Harmonized	Elsevier, (2021). Refractive Index	Reaxys: physical-chemical property dat	ta for Chrysotile.			
Template:						
HERO ID:	7924810					
			EXTRACTIO	N		
Parameter		Data				
Refractive Index		1.532 - 1.544				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR				
Temperature		Not reported				
System		Not reported				
Standard Deviation Results		Not Reported				
Results Details		1 range for n(alpha) was reported in Rea	xys.			
Results Details Methods		Not Reported				
Parameter		Not Reported				
		1				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Daliahil						
Domain 2: Test Kellabil	Ily Matria 2:	Paliability/Unbiased	Madium	There is no indication that the methodology for meducing the information his		
	Metric 5:	(Mathad Ohia stinita)	Medium	towards a particular product or outcome		
	Matria 4:	(Method Objectivity) Reliability/Analytical Mathod	Madium	The analytical method is unknown but is likely to be appropriate based on the date's		
	Weule 4.	Kenaointy/Anarytical Method	Wedium	inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 5. Other	Matria 5.	Detabases	Tich	The information of date is from a generalized data and structure for an item with the data		
	wietric 5:	Databases	High	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	ty Determin	nation	High			

\* Related References: Selfrige, G. C.; American Mineralogist; vol. 21; (1936); p. 477

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 7924816 Table: 1 of 2

Study Citation: OECD Harmonized	Elsevier, (2021) Refractive Index	Reaxys: physical-chemical property o	lata for Richterite.	
HERO ID:	7924816			
			EXTRACTIO	N
Parameter		Data		
Refractive Index		1 594		
CASRN and Test Material		17068-76-7: Richterite		
Confidentiality Type and (	Guideline	None: Experimental: Not reported		
Solvent Reactivity Storage	e and Stability	NR·NR·NR		
Radiolabel, Source, State, a	and Purity	NR: NR: Solid: NR		
Temperature	and I drivy	Not reported		
System		Not reported		
Standard Deviation Results	5	Not Reported		
Results Details		n(p). 1 value reported in Reaxys.		
Results Details Methods		Not Reported		
Parameter		Not Reported		
		-		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Toot Daliahil	:			
Domain 2. Test Kellaoli	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	mente J.	(Method Objectivity)	wieuruili	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	

\* Related References: Korytkova, E. N.; Romanov, D. P.; Makarova, T. A.; Grebenshchikov, R. G.; InorganicMaterials; vol. 22; (1986); p. 1315 - 1320; Izvestiya Akademii Nauk SSSR, Neorganicheskie Materialy; vol. 22; (1986); p. 1500 - 1505

Asbestos

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

Study Citation:	Elsevier, (2021)	. Reaxys: physical-chemical property d	lata for Richterite.	
OECD Harmonized	Refractive Inde	X		
Template:				
HERO ID:	7924816			
			EXTRACTIO	N
Parameter		Data		
Refractive Index		1 606		
CASRN and Test Material		17068-76-7: Richterite		
Confidentiality, Type, and	Guideline	None: Experimental: Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Temperature		Not reported		
System		Not reported		
Standard Deviation Results	5	Not Reported		
Results Details		n(g). 1 value reported in Reaxys.		
Results Details Methods		Not Reported		
Parameter		Not Reported		
			EVALUATIO	AT
Domain		Metric	Rating	Comments
Domain 1: Substance		ivicule	Runng	Connicity
Domain 1. Substance	Metric 1.	Representativeness	High	Data are measured for the subject chemical substance
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Matria 4.	(Method Objectivity)	M - 1	towards a particular product or outcome.
	Metric 4:	Kenabinty/Analytical Method	Medium	inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3 <sup>,</sup> Other				
Domain 5. Ouler	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	tv Determi	nation	High	

\* Related References: Korytkova, E. N.; Romanov, D. P.; Makarova, T. A.; Grebenshchikov, R. G.; InorganicMaterials; vol. 22; (1986); p. 1315 - 1320; Izvestiya Akademii Nauk SSSR, Neorganicheskie Materialy; vol. 22; (1986); p. 1500 - 1505

\_

\_

Study Citation:	Lott, P. E. (2002). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers - an update. Microchemical					
<b>OECD Harmonized</b>	Refractive Index	cefractive Index				
Template:						
HERO ID:	6874055					
		EXTRACTION				
Parameter		Data				
Refractive Index		1.493 - 1.562				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and G	Juideline	None; Calculation; NA; dispersion staining method. Analytical method used cited as Ref. 1: Lott, P. F. (1989). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers. Microchemical journal, 39(2), 145-148.				
Solvent, Reactivity, Storage	, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, and	nd Purity	NA; NIST reference material; Solid; NR Notes: NR				
Temperature		NR				
System		Not Reported				
Standard Deviation Results		Not Reported				
Results Details		alpha = 1.493 - 1.560; gamma = 1.517 - 1.562				
Results Details Methods		Not Reported				
Parameter		Extinction: parallel; refractive index = refractive index oil + correction factor; correction factor determined from annular stop and central stop colors and the wavelength the colors were observed at.				

			EVALUATION	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method was reported elsewhere.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

Study Citation:	Lott, P. E. (2002). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers - an update. Microchemical				
	Journal 72(3):251	2(3):251-254.			
OECD Harmonized	Refractive Index				
Template:					
HERO ID:	<b>D ID:</b> 6874055				
		EXTRACTION			
Parameter		Data			
Refractive Index		1 654 - 1 717			
CASRN and Test Material		12001 - 1.777			
Confidentiality, Type, and Guideline		None; Calculation; NA; dispersion staining method. Analytical method used cited as Ref. 1: Lott, P. F. (1989). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers. Microchemical journal 39(2), 145-148			
Solvent, Reactivity, Storage, and Stability		NA: NR: NR: NR			
Radiolabel, Source, State, and Purity		NA: NIST reference material: Solid: NR Notes: NR			
Temperature	•	NR			
System		Not Reported			
Standard Deviation Results		Not Reported			
Results Details		alpha = 1.654 - 1.701; gamma = 1.668 - 1.717			
Results Details Methods		Not Reported			
Parameter		Extinction: inclined; refractive index = refractive index oil + correction factor; correction factor determined from annular stop and central stop colors and the wavelength the colors were observed at.			

EVALUATION				
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method was reported elsewhere.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quali	<b>Overall Quality Determination</b>		High	

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6874055 Table: 3 of 6

<b>Study Citation:</b> Lott, P. E. (2002). Correlating dispersion staining colors to the numerical value of the refractive index for Lournal 72(3):251–254			refractive index for asbestos fibers - an update. Microchemical			
OECD Harmonized	ized Refractive Index					
Template:						
HERO ID:	6874055	/4055				
			EXTRACTION			
Parameter		Data				
Refractive Index		1 599 - 1 688				
CASRN and Test Material		12172-67-7: Actinolite				
Confidentiality, Type, and Guideline		None; Calculation; NA; dispersion staining method. Analytical method used cited as Ref. 1: Lott, P. F. (1989). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers. Microchemical journal, 39(2), 145-148.				
Solvent, Reactivity, Storag	ge, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State,	and Purity	NA; NIST reference mater	ial; Solid; NR Notes: NR			
Temperature		NR				
System		Not Reported				
Standard Deviation Result	s	Not Reported				
Results Details		alpha = 1.599 - 1.668; gan	nma = 1.622 - 1.688			
Results Details Methods		Not Reported				
Parameter		Extinction: inclined; refractive index = refractive index oil + correction factor; correction factor determined from annular stop and cent colors and the wavelength the colors were observed at.		or; correction factor determined from annular stop and central stop		
			EVALUATION			
Domain		Metric	Rating	Comments		

Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method was reported elsewhere.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
			U	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>		High		

Study Citation:	Lott, P. E. (2002). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers - an update. Microchemical					
	Journal 72(3):251-254.					
<b>OECD Harmonized</b>	Refractive Index					
Template:						
HERO ID:	874055					
	EXTRACTION					
Parameter	Data					
Refractive Index	1.596 - 1.676					
CASRN and Test Material	17068-78-9; Anthophyllite	17068-78-9; Anthophyllite				
Confidentiality, Type, and G	leline None; Calculation; NA; dispersion staining method. Analytical method used cited as Ref. 1: Lott, P. F. (1989). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers. Microchemical journal, 39(2), 145-148.					
Solvent, Reactivity, Storage,	nd Stability NA; NR; NR; NR					
Radiolabel, Source, State, ar	Purity NA; NIST reference material; Solid; NR Notes: NR					
Temperature	NR					
System	Not Reported					
Standard Deviation Results	Not Reported					
Results Details	alpha = 1.596 - 1.652; gamma = 1.615 - 1.688					
Results Details Methods	Not Reported					
Parameter	Extinction: parallel; refractive index = refractive index oil + correction factor; correction factor determined from annular stop and central stop colors and the wavelength the colors were observed at.					

EVALUATION				
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method was reported elsewhere.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quali	ty Determi	ination	High	
# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6874055 Table: 5 of 6

Study Citation:	Lott, P. E. (2002). Journal 72(3):251-2	Correlating dispersion staining colors to 254	the numerical value of the	refractive index for asbestos fibers - an update. Microchemical		
<b>OECD Harmonized</b>	Refractive Index					
Template:						
HERO ID:	6874055					
		E	XTRACTION			
Parameter		Data				
Refractive Index		1.635 - 1.729				
CASRN and Test Material		12172-73-5; Amosite				
Confidentiality, Type, and G	uideline	None; Calculation; NA; dispersion staining	method. Analytical method used	cited as Ref. 1: Lott, P. F. (1989). Correlating dispersion staining		
		colors to the numerical value of the refractive	e index for asbestos fibers. Micro	chemical journal, 39(2), 145-148.		
Solvent, Reactivity, Storage, and Stability		NA; NR; NR; NR				
Radiolabel, Source, State, and Purity		NA; NIST reference material; Solid; NR Notes: NR				
Temperature		NR				
System		Not Reported				
Standard Deviation Results		Not Reported				
Results Details		alpha = 1.635 - 1.696; gamma = 1.655 - 1.72	9			
Results Details Methods		Not Reported				
Parameter		Extinction: parallel; refractive index = refra colors and the wavelength the colors were ob	ctive index oil + correction factors served at.	or; correction factor determined from annular stop and central stop		
		E	VALUATION			
Domain		Metric	Rating	Comments		

			U	
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Relial	bility			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method was reported elsewhere.
Domain 2: Other				
Domain 5. Other	Matric 5:	Databases	High	The information or date is from a recognized date collection/repository where date are
	Metric 5.	Databases	rigi	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
		•	<b>TT1</b>	
<b>Overall Qual</b>	lity Determ	ination	High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6874055 Table: 6 of 6

Study Citation:	Lott, P. E. (2002). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers - an update. Microchemical
	Journal 72(3):251-254.
OECD Harmonized	Refractive index
	6874055
HERO ID;	0874033
	EXTRACTION
Parameter	Data
Refractive Index	1.599 - 1.688
CASRN and Test Material	14567-73-8; Tremolite
Confidentiality, Type, and C	Guideline None; Calculation; NA; dispersion staining method. Analytical method used cited as Ref. 1: Lott, P. F. (1989). Correlating dispersion staining colors to the numerical value of the refractive index for asbestos fibers. Microchemical journal, 39(2), 145-148.
Solvent, Reactivity, Storage	e, and Stability NA; NR; NR
Radiolabel, Source, State, a	and Purity NA; NIST reference material; Solid; NR Notes: NR
Temperature	NR
System	Not Reported
Standard Deviation Results	s Not Reported
Results Details	alpha = 1.599 - 1.668; gamma = 1.622 - 1.688
Results Details Methods	Not Reported
Parameter	Extinction: inclined; refractive index = refractive index oil + correction factor; correction factor determined from annular stop and central stop colors and the wavelength the colors were observed at.

			EVALUATION	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method was reported elsewhere.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qual	ity Determ	ination	High	

Study Citation:	Lott, P. F. (1989). C	Correlating dispersion staining colors to the	e numerical v	alue of the refractive-index for asbestos fibers. Microchemical Journal 39(2):145-
OECD Harmonized	148. Refractive Index			
Template:				
HERO ID:	6866754			
		E	XTRACTIO	N
Parameter		Data		
Refractive Index		1.493 - 1.560		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and G	Juideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and	nd Purity	NR; NR; NR; NR		
Temperature		Not reported		
System		slopes of the dispersion curves at wavelength	s of 400-700 n	m were studied to obtain a set of correction values to assist in the determination of the
Standard Deviation Results		true refractive index Not reported		
Results Details		refractive index range measured parallel to fil	her length was	1 517-1 562
Results Details Methods		Not Reported	ber lengtit was	
Parameter		Not Reported		
		1		
		E	VALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Demain 2. Test Delishili	<b>4</b> -1			
Domain 2: Test Kenadin	ly Matria 2:	Paliability/Unbiased	High	The methodology for meducing the information is designed to another accessific quee
	Metric 5.	(Method Objectivity)	nign	tion and the methodology's objective is clear
	Metric 4	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate
		Kennomey/ mary tear Welliou	meanin	The analysism method is anknown out is neery to be appropriate.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

**Overall Quality Determination** 

High

Study Citation:	Lott, P. F. (1989). Correlating dispersion staining colors to the numerical value of the refractive-index for asbestos fibers. Microchemical Journal 39(2):145-
OFCD Harmonized	148. Refractive Index
Tomplato.	
HERO ID:	6866754
	EXTRACTION
Parameter	Data
Refractive Index	1.635 - 1.696
CASRN and Test Material	12172-73-5; Amosite
Confidentiality, Type, and Gu	uideline None; Experimental; Not reported
Solvent, Reactivity, Storage,	, and Stability NR; NR; NR
Radiolabel, Source, State, and	nd Purity NR; NR; NR
Temperature	Not reported
System	slopes of the dispersion curves at wavelengths of 400-700 nm were studied to obtain a set of correction values to assist in the determination of the
	true refractive index
Standard Deviation Results	Not reported
Results Details	refractive index range measured parallel to fiber length was 1.655-1.729
Results Details Methods	Not Reported
Parameter	Not Reported

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliab	oility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qual</b>	ity Determ	ination	High	

Study Citation:	Lott, P. F. (1989). C	Correlating dispersion staining colors to the numerical value of the refractive-index for asbestos fibers. Microchemical Journal 39(2):145-
OFCD Harmonized	148. Refractive Index	
Template.	Refractive muck	
HERO ID:	6866754	
		EXTRACTION
Parameter		Data
Refractive Index		1.654 - 1.701
CASRN and Test Material		12001-28-4; Crocidolite
Confidentiality, Type, and Guideline		None; Experimental; Not reported
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR
Radiolabel, Source, State, a	and Purity	NR; NR; NR
Temperature		Not reported
System		slopes of the dispersion curves at wavelengths of 400-700 nm were studied to obtain a set of correction values to assist in the determination of the
Standard Deviation D 1		true refractive index
Standard Deviation Results	5	
Results Details		retractive index range measured perpendicular to fiber length was 1.668-1./17
Results Details Methods		Not Reported
Parameter		Not Reported

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Relia	oility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Over	ter Datarra	ination	II:ah	
Overall Qual	iny Determ	mation	High	

Study Citation: OECD Harmonized	Lott, P. F. (1989). Correlating dispersion staining colors to the numerical value of the refractive-index for asbestos fibers. Microchemical Journa 148. Refractive Index	1 39(2):145-
Template: HERO ID:	5866754	
Description	EXTRACTION	
Parameter	Data	
Refractive Index	1.596 - 1.652	
CASRN and Test Material	77536-67-5; Anthophyllite	
Confidentiality, Type, and G	ideline None; Experimental; Not reported	
Solvent, Reactivity, Storage,	nd Stability NR; NR; NR	
Radiolabel, Source, State, an	Purity NR; NR; NR	
Temperature	Not reported	
System	slopes of the dispersion curves at wavelengths of 400-700 nm were studied to obtain a set of correction values to assist in the determinati	on of the
Standard Deviation Deculta	true refractive index	
Standard Deviation Results		
Results Details	retractive index range measured parallel to fiber length was 1.615-1.676	
Results Details Methods	Not Reported	
Parameter	Not Reported	

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliab	oility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qual</b>	ity Determ	ination	High	

Study Citation:	Lott, P. F. (1989). Correlating dispersion staining colors to the numerical value of the refractive-index for asbestos fibers. Microchemical Journal 39(	(2):145-
OFCD Harmonized	148. Refractive Index	
Templeter	Kenacuve nicex	
	6966751	
HERO ID:		
	EXTRACTION	
Parameter	Data	
Refractive Index	1.599 - 1.668	
CASRN and Test Material	77536-68-6; Tremolite	
Confidentiality, Type, and C	uideline None; Experimental; Not reported	
Solvent, Reactivity, Storage	and Stability NR; NR; NR	
Radiolabel, Source, State, a	d Purity NR; NR; NR	
Temperature	Not reported	
System	slopes of the dispersion curves at wavelengths of 400-700 nm were studied to obtain a set of correction values to assist in the determination of	f the
	true refractive index	
Standard Deviation Results	Not reported	
Results Details	Tremolite-actinolite reported together; refractive index range measured parallel to fiber length was 1.622-1.688	
Results Details Methods	Not Reported	
Parameter	Not Reported	

			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliab	oility						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Quality Determination			High				

Study Citation:	Lott, P. F. (1989). C	Correlating dispersion staining colors to the numerical value of the refractive-index for asbestos fibers. Microchemical Journal 39(2):145-			
•	148.				
OECD Harmonized	Refractive Index				
Template:					
HERO ID:	6866754				
		EXTRACTION			
Parameter		Data			
Refractive Index		1.599 - 1.668			
CASRN and Test Material		77536-66-4; Actinolite			
Confidentiality, Type, and	Guideline	None; Experimental; Not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR			
Temperature		Not reported			
System		slopes of the dispersion curves at wavelengths of 400-700 nm were studied to obtain a set of correction values to assist in the determination of the			
		true refractive index			
Standard Deviation Results		Not reported			
Results Details		Tremolite-actinolite reported together; refractive index range measured parallel to fiber length was 1.622-1.688			
Results Details Methods		Not Reported			
Parameter		Not Reported			

			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliab	oility						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Quality Determination			High				

HERO ID: 3860485 Table: 1 of 1

Study Citation: OECD Harmonized	(2017). PubChem: Refractive Index	Chrysotile.		
Template:				
HERO ID:	3860485			
			EXTRACTION	
Parameter		Data		
Refractive Index		Not Reported		
CASRN and Test Material		12001-29-5; Not Reported		
Confidentiality, Type, and C	Guideline	Not Reported; Not Reported; Not Reported	1	
Solvent, Reactivity, Storage	, and Stability	Not Reported; Not Reported; Not Reported	l; Not Reported	
Radiolabel, Source, State, a	nd Purity	Not Reported; Not Reported; Not Reported	l; Not Reported	
Temperature		Not Reported		
System		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Index of refraction: 1.53-1.56		
Results Details Methods		Not Reported		
Parameter		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ty			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 2. Other				
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determina	ntion	Medium	

\* Related References: Source: Kirk-Othmer Encyclopedia of Chemical Technology. 4th ed. Volumes 1: New York, NY. John Wiley and Sons, 1991-Present., p. V3 (1992) 671 (not a primary source)

HERO ID: 7924733 Table: 1 of 1

Study Citation: OECD Harmonized	NLM, (2021). Pu Refractive Index	ubChem: Hazardous Substance Data B	ank: Chrysotile, 1	2001-29-5.
HERO ID:	7924733			
			EXTRACTIO	N
Parameter		Data		
Refractive Index		1.53 - 1.56		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR		
Temperature		Not reported		
System		Not reported		
Standard Deviation Results		Not Reported		
Results Details		Not Reported		
Results Details Methods		Not Reported		
Parameter		Not Reported		
			FVAL HATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance			6	
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
	_			
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
	N	(Method Objectivity)		
	Metric 4:	Reliability/Analytical Method	Medium	The analytic method is unknown but is expected to be appropriate based on the study's inclusion in a peer-reviewed database.
Domain 3: Other				
Domain J. Outer	Metric 5	Databases	High	Data is from a publicly available and peer-reviewed database
	Metric 6:	Models	N/A	Bating of this factor is not applicable to this kind of information
	metric 0.	1100015	11/71	Nating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	nation	High	

\* Related References: Virta R; Asbestos. Kirk-Othmer Encyclopedia of Chemical Technology. (1999-2018). New York, NY: John Wiley & Sons. Online Posting Date: 15 Jul 2011

\_

\_

Study Citation:	Seshan, K. (1983). How are the physical and chemical properties of chrysotile asbestos altered by a 10-year residence in water and up to 5 days in simulated						
OFCD Harmonized	stomach acid?. Er	stomach acid?. Environmental Health Perspectives 53(NOV):143-148. Refractive Index					
Template:	Reflactive muck						
HERO ID:	3582855						
		EXTRACTION					
Parameter		Data					
Refractive Index		1.5 - 1.54					
CASRN and Test Material		12001-29-5; Chrysotile asbestos					
Confidentiality, Type, and	Guideline	None; Experimental; Not reported					
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State,	and Purity	No; International Union Against Cancer (UICC); National Institute of Environmental Health Sciences (NIEHS); Globe, AZ.; NR; NR					
Temperature		Not reported					
System		globe chrysotile fibers exposed approx. 600 h (from figure) to simulated gastric juice (NaCl, pepsin (hog extract), and HCl added to distilled water). pH of 1.2.					
Standard Deviation Results		Not reported					
Results Details		Refractive index along and perpendicular to the fiber axis decreased from approx. 1.54 to 1.5 over 600 hours exposure (from figure) measured by X-ray and electron diffraction.					
Results Details Methods		Not Reported					
Parameter		Not Reported					

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliab	ility					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 3582855 Table: 2 of 2

Study Citation:	Seshan, K. (198	Seshan, K. (1983). How are the physical and chemical properties of chrysotile asbestos altered by a 10-year residence in water and up to 5 days in simulated stomach acid? Environmental Health Perspectives 53(NOV):143-148					
<b>OECD Harmonized</b>	Refractive Index						
Template:							
HERO ID:	3582855						
			EXTRACTIO	N			
Parameter		Data					
Refractive Index		1 44 - 1 485					
CASRN and Test Material	l	12001-29-5: Chrysotile asbestos					
Confidentiality, Type, and	Guideline	None: Experimental: Not reported					
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR					
Radiolabel, Source, State,	and Purity	No; International Union Against Cancer (UICC); National Institute of Environmental Health Sciences (NIEHS); Globe, AZ.; NR; NR					
Temperature		Not reported					
System		globe chrysotile fibers exposed ap	prox. 600 h (from figure)	to 1N HCl.			
Standard Deviation Result	s	Not reported					
Results Details		Refractive index decreased from a	efractive index decreased from approx. 1.485 to 1.44 over 600 hours exposure (from figure) measured by X-ray and electron diffraction.				
Results Details Methods		Not Reported					
Parameter		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
		· · ·	37/1				

	1.100110 11	representativeness	11.8.	Data die measured of estimated for the subject enemetal substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
	1 .1.4			
Domain 2: Test Relia	bility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)	C	tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to
		<u> </u>	U	OECD guidelines for physical-chemical properties or other developed standard.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Oual</b>	Overall Quality Determination			
<b>Overall Quality Determination</b>			High	

Study Citation:	U.S. EPA, (2014).	Toxicological review of libby amphibole	e asbestos: In sup	port of summary information on the Integrated Risk Information System		
<b>OECD Harmonized</b>	Refractive Index					
Template: HERO ID:	3827272					
EXTRACTION						
Parameter		Data				
Refractive Index		= 1.600 (alpha) - = 1.688 (gamma)				
CASRN and Test Material		77536-66-4; Actinolite				
Confidentiality, Type, and C	luideline	none; not specified; not specified				
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR	1			
Tomporatura	na Purity	NR; NR; NR; NR Notes: Optical and crystallo	ographic properties (	in librous amphiboles associated with Libby Amphibole asbestos		
System		not reported				
Standard Deviation Results		not reported				
Results Details		Refractive indices: $alpha = 1.600 - 1.628$ , 1.61	2-1.668. 1.613-1.	628, 1.6126; gamma 1.625–1.655, 1.635–1.688, 1.638–1.655, 1.6393		
Results Details Methods		not reported				
Parameter		not reported				
		E	VALUATION			
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabili	ty					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	Matria A.	(Method Objectivity)	τ	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.		
Domain 3: Other						
Domain 5. Outer	Metric 5	Databases	Medium	The data are from a source that is known but is missing elements required for High		
	Weule 5.	Databases	Wedium	designation such as peer-review, public availability, or the inclusion of references to original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	Overall Quality Determination Medium					

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

Study Citation:	U.S. EPA, (2014).	Toxicological review of libby ampl	nibole asbestos:	In support of summary information on the Integrated Risk Information System			
OECD Harmonized	(IKIS). Refractive Index						
Template:							
HERO ID:	3827272						
			EXTRACTIO	N			
Parameter		Data					
Refractive Index		= 1.605 (alpha) - $= 1.641$ (gamma)					
CASRN and Test Material		17068-76-7; Richerite					
Confidentiality, Type, and Guideline		none; not specified; not specified					
Solvent, Reactivity, Storage, and Stability		NR; NR; NR; NR					
Radiolabel, Source, State, and Purity		NR; NR; NR Notes: Optical and crystallographic properties of fibrous amphiboles associated with Libby Amphibole asbestos					
Temperature		not reported					
System		not reported					
Standard Deviation Results	6	not reported $P_{a}$ and $P_{a}$ and $P_$	2 1 605 1 624 1 6	$15_{12} \circ 00000 = 1.629 - 1.620 - 1.627 - 1.641 - 1.626$			
Results Details Results Details Methods		Refractive indices: $aipna = 1.022 - 1.023$ , $1.005 - 1.024$ , $1.015$ ; gamma = $1.038 - 1.039$ , $1.027 - 1.041$ , $1.030$					
Parameter		not reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance	Matria 1	Paprocentativanass	Uich	Date are measured or estimated for the subject chemical substance			
	Metric 2:	Appropriateness	High	Data are measured or estimated for the subject chemical substance.			
	Metrie 2.	rippropriateness	Ingii	incastree data are consistent with the subject chemical substance structural reactives.			
Domain 2: Test Reliabil	lity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)	T	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Oualit	ty Determina	ation	High				

\* Related References: www.minsocam.oeg/msa/Handbook/Richterite.PDF.; www.webmineral.com/data/Richterite.shtml.

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

Study Citation:	U.S. EPA, (2014). (IRIS)	Toxicological review of libby amphibole	e asbestos: In sup	pport of summary information on the Integrated Risk Information System			
<b>OECD Harmonized</b>	Refractive Index						
Template:							
HERO ID:	3827272						
		EXTRACTION					
Parameter		Data					
Refractive Index		= 1.599 (alpha) - = 1.655 (gamma)					
CASRN and Test Material		14567-73-8; Tremolite					
Confidentiality, Type, and G	luideline	none; not specified; not specified					
Solvent, Reactivity, Storage,	, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, an	nd Purity	NR; NR; NR; NR Notes: Optical and crystalle	ographic properties of	of fibrous amphiboles associated with Libby Amphibole asbestos			
Temperature		not reported					
System		not reported					
Standard Deviation Results		not reported					
Results Details		Refractive indices: $alpha = 1.600 - 1.628, 1.60$	04-1.612, 1.599-1.	612, 1.6063; gamma 1.625–1.655, 1.627–1.635, 1.625–1.637, 1.6343			
Results Details Methods		not reported					
Parameter		not reported					
		E	VALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabili	ty						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
	Metric 5:	Databases	Medium	The data are from a source that is known but is missing elements required for High			
				designation such as peer-review, public availability, or the inclusion of references to			
	Matria 6:	Models	NI/A	original sources.			
	wietric of	WIOUCIS	IN/A	Raung of uns factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	y Determina	tion	Medium				

Page **375** of **522** 

Study Citation:	U.S. EPA, (2014).	Toxicological review of libby ampl	nibole asbestos:	In support of summary information on the Integrated Risk Information System			
OECD Harmonized	(IRIS). Refractive Index						
Template:							
HERO ID:	3827272						
			EXTRACTIO	N			
Parameter		Data					
Refractive Index		= 1.618 (alpha) - = 1.658 (gamma)					
CASRN and Test Material		12425-92-2; Winchite					
Confidentiality, Type, and C	Guideline	none; not specified; not specified					
Solvent, Reactivity, Storage, and Stability		NR; NR; NR; NR					
Radiolabel, Source, State, and Purity		NR; NR; NR; NR Notes: Optical and cr	ystallographic prop	erties of fibrous amphiboles associated with Libby Amphibole asbestos			
Temperature		not reported					
System		not reported					
Standard Deviation Results		not reported $P_{a}$	ot reported				
Results Details Methods		Refractive indices: $aipila = 1.018 - 1.020$	5, 1.018-1.021, 1.0	29, 1.030;  gamma = 1.034 - 1.042, 1.034 - 1.037, 1.030, 1.038			
Parameter		not reported					
		•					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance	Matria 1.	Democratic	TT: -1-				
	Metric 2:	Appropriateness	High	Data are measured or estimated for the subject chemical substance.			
	Wietrie 2.	Appropriateness	Ingn	weasured data are consistent with the subject chemical substance structural relatives.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Oualit	v Determina	ation	High				

**Overall Quality Determination** 

\* Related References: Bandli et al. (2003) Optical, compositional, morphological, and x-ray data on eleven particles of amphibole from Libby, MT, U.S.A. Canadian Mineralogist 41: 1241-1253. (HERO ID 713658); Wylie and Verkouteren (2000) Amphibole asbestos from Libby, MT: Aspects of nomenclature. American Mineralogist, 85: 1540-1542.(HERO ID 713648); www.minsocam.oeg/msa/Handbook/Winchite.PDF.; www.mindat.org/min-4296.html.

Study Citation:	Verkouteren, J. ments Microbe	Verkouteren, J. R., Wylie, A. G., Steel, E. B., Lim, M. S. (1995). Analysis of the tremolite/actinolite series using high precision refractive index measure- ments. Microbeam Analysis :27-28					
OECD Harmonized	Refractive Inde	X					
Template:							
HERO ID:	6887461						
			EXTRACTIO	N			
Parameter		Data					
Refractive Index		1.626 - 1.684					
CASRN and Test Material		1332-21-4; Asbestos					
Confidentiality, Type, and	Guideline	None; Experimental; other					
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: tremolite-actin	olite				
Temperature	-	Not reported					
System		Used the spindle stage to measure principal refractive indices of individual fibers or particles with an accuracy of $\pm 0.0005$					
Standard Deviation Result	s	Not reported					
Results Details		results taken from figure; plot of gamma-refractive index vs Mg/Mg+Fe					
Results Details Methods		Not Reported					
Parameter		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabi	lity						
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-			
		(Method Objectivity)	U	tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			

**Overall Quality Determination** 

High

HERO ID: 3859385 Table: 1 of 4

Study Citation: OECD Harmonized	Virta, R. L. (2004). Refractive Index	Asbestos. 3:288-319.		
Template: HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
Refractive Index		1.60 - 1.64		
CASRN and Test Material		14567-73-8; tremolite		
Confidentiality, Type, and C		none; not specified; not specified		
Badialabal Source State	, and Stability	NK; NK; NK; NK ND: ND: ND Ndtos: ND		
Temperature	na i unity	not reported		
System		not reported		
Standard Deviation Results		not reported		
Results Details		not reported		
Results Details Methods		not reported		
Parameter		not reported		
			EVALUATION	Ň
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	tv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other	Matria F.	Detehan	II: -1	
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determina	ition	High	

HERO ID: 3859385 Table: 2 of 4

Study Citation:	Virta, R. L. (2004)	. Asbestos. 3:288-319.		
Template	Refractive muex			
HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
Refractive Index		1.53 - 1.56		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Temperature		not reported		
System		not reported		
Standard Deviation Results		not reported		
Results Details		not reported		
Results Details Methods		not reported		
Parameter		not reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 2: Other				
Domain 5. Other	Metric 5	Databases	High	The information or data is from a recognized data collection/renository where data are
	Wettie 5.	Databases	Ingn	peer-reviewed by experts in the field, are broadly available to the public for review and
				use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determina	ation	High	

HERO ID: 3859385 Table: 3 of 4

Study Citation:	Virta, R. L. (2004). Refractive Index	Asbestos. 3:288-319.		
Template:	Kenacuve muex			
HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		-
Refractive Index		1.65 - 1.72		
CASRN and Test Material		12001-28-4; crocidolite		
Confidentiality, Type, and G	luideline	none; not specified; not specified		
Solvent, Reactivity, Storage,	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, an	nd Purity	NR; NR; NR; NR Notes: NR		
Temperature		not reported		
System		not reported		
Standard Deviation Results		not reported		
Results Details		not reported		
Results Details Methods		not reported		
Parameter		not reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ty			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determina	ntion	High	

HERO ID: 3859385 Table: 4 of 4

Study Citation: OECD Harmonized	Virta, R. L. (2004 Refractive Index	). Asbestos. 3:288-319.		
HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
Refractive Index CASRN and Test Material		1.63 - 1.73 12172-73-5: amosite		
Confidentiality, Type, and C Solvent, Reactivity, Storage	Guideline e, and Stability	none; not specified; not specified NR; NR; NR; NR		
Temperature System	uid Purity	not reported not reported		
Standard Deviation Results Results Details		not reported not reported		
Parameter		not reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	Metric 1: Metric 2:	Representativeness Appropriateness	High High	Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determin	ation	High	

Study Citation:	Xu, X. M., Li, Ferroelectrics 1	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated Ferroelectrics 188(1):136-147.					
OECD Harmonized	Refractive Inde	X					
Template:							
HERO ID:	6860096						
			EXTRACTIO	N			
Parameter		Data					
Refractive Index		1.641 - 1.677					
CASRN and Test Material	l	77536-66-4; Actinolite					
Confidentiality, Type, and	Guideline	None; Experimental; NA					
Solvent, Reactivity, Storag	ge, and Stability	NA; NR; NR					
Radiolabel, Source, State,	and Purity	NA; Health and Safety Laborator	ry, UK and KTR laboratory	v, South Korea; Solid; NR Notes: Asbestos-standard sample			
Temperature	-	NR		-			
System		LV100 polarizing microscope an	d refractive index oil				
Standard Deviation Result	s	Not Reported					
Results Details		Not Reported					
Results Details Methods		Not Reported					
Parameter		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			

	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2. Test Relia	hility			
Domain 2. Test Rena	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6860096 Table: 2 of 11

Study Citation:	Xu, X. M., Li, Y. Ferroelectrics 188	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated Ferroelectrics 188(1):136-147.				
<b>OECD Harmonized</b>	Refractive Index					
Template: HERO ID:	6860096					
			EXTRACTIO	N		
Parameter		Data				
Refractive Index		1.683 - 1.700				
CASRN and Test Material		77536-67-5; Anthophyllite				
Confidentiality, Type, and C	Juideline	None; Experimental; NA				
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NA; Health and Safety Laboratory, UK and	d KTR laboratory	7, South Korea; Solid; NR Notes: Asbestos-standard sample		
Temperature		NR				
System	LV100 polarizing microscope and refractive index oil					
Standard Deviation Results		Not Reported				
Results Details		Not Reported				
Results Details Methods		Not Reported				
Parameter		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2 <sup>.</sup> Test Reliabili	itv					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
		(Method Objectivity)	8	tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 2: Other						
Domain 5: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are		
	wienie J.	Databases	nigii	neer-reviewed by experts in the field, are broadly available to the public for review and		
				use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
	- D-4 '		TT: _1			
Overall Qualit	y Determina	ation	High			

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6860096 Table: 3 of 11

Study Citation:	Xu, X. M., Li, Y. C Ferroelectrics 1880	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated Ferroelectrics 188(1):136-147.			
<b>OECD Harmonized</b>	Refractive Index	1).130 111.			
Template: HERO ID:	6860096				
		I	EXTRACTIO	N	
Parameter		Data			
Refractive Index		1.537 - 1.554			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and C	Juideline	None; Experimental; NA			
Solvent, Reactivity, Storage, and Stability NA; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NA; Health and Safety Laboratory, UK and	l KTR laboratory	, South Korea; Solid; NR Notes: Asbestos-standard sample	
Temperature		NR			
System		LV100 polarizing microscope and refractive	e index oil		
Standard Deviation Results		Not Reported			
Results Details		Not Reported			
Results Details Methods		Not Reported			
Parameter		Not Reported			
		]	EVALUATION	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	tv				
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-	
		(Method Objectivity)	6	tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	y Determina	ation	High		

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6860096 Table: 4 of 11

Study Citation:	Xu, X. M., Li, Y.	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated				
OECD Harmonized	Refractive Index	(1):130-14/.				
Template:						
HERO ID:	6860096					
		E	XTRACTIO	N		
Parameter		Data				
Defenations Index		1 5 4 5 1 5 5 7				
CASEN and Test Material		1.343 - 1.337 12172 73 5: Amosita				
Capfidentiality Type and C	Juidalina	None: Experimental: NA				
Connuentianty, Type, and C	Juluellile	None, Experimental, NA				
Dadialahal Sauraa Stata	e, and Stability	INA; INK; INK; INK	VTD laborators	, South Kanaa Salid ND Natas Ashastas standard samula		
Tamparatura	ind Purity	NA, Health and Safety Laboratory, UK and	KIK laboratory	, South Korea, Sond, NK Notes: Asbestos-standard sample		
System		INK	inday oil			
System Standard Deviation Results		Not Reported	index on			
Results Details		Not Reported				
Results Details Methods		Not Reported				
Parameter		Not Reported				
		F	EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Tast Daliahili	+.,					
Domain 2. Test Kenadin	Metric 3.	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific gues		
	Meure 5.	(Method Objectivity)	nigii	tion and the methodology's objective is clear		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
		• •		· • •		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	y Determina	ation	High			

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6860096 Table: 5 of 11

Study Citation:	Xu, X. M., Li, Y. Ferroelectrics 188	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated Ferroelectrics 188(1):136-147.					
<b>OECD Harmonized</b>	Refractive Index	(1).150 117.					
Template: HERO ID:	6860096						
	EXTRACTION						
Parameter		Data					
Refractive Index		1.670 - 1.675					
CASRN and Test Material		12172-73-5; Amosite					
Confidentiality, Type, and C	Guideline	None; Experimental; NA					
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NA; Health and Safety Laboratory, UK an	d KTR laboratory	y, South Korea; Solid; NR Notes: Asbestos-standard sample			
Temperature		NR					
System		LV100 polarizing microscope and refracti	ve index oil				
Standard Deviation Results		Not Reported					
Results Details		Not Reported					
Results Details Methods		Not Reported					
Parameter		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance		Wieure	Rating	comments			
Domain 1. Substance	Metric 1	Representativeness	High	Data are measured for the subject chemical substance			
	Metric 2:	Appropriateness	N/A	Bating of this factor is not applicable to this kind of information			
	Meure 2.	rippiopriateness	10/11	Rading of this factor is not appreade to this kind of morniation.			
Domain 2: Test Reliabili	ity						
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-			
		(Method Objectivity)	U U	tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.			
Demain 2. Other							
Domain 3: Other	Matria 5.	Databasas	Hisk				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Qualit	y Determina	ation	High				

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6860096 Table: 6 of 11

Study Citation:	Xu, X. M., Li, Y. C Ferroelectrics 188(	Ku, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated Serroelectrics 188(1):136-147.				
<b>OECD Harmonized</b>	Refractive Index	Refractive Index				
Template: HERO ID:	6860096					
		E	XTRACTIO	N		
Parameter		Data				
Refractive Index		1.683 - 1.694				
CASRN and Test Material		12001-28-4; Crocidolite				
Confidentiality, Type, and C	Buideline	None; Experimental; NA				
Solvent, Reactivity, Storage	, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NA; Health and Safety Laboratory, UK and	KTR laboratory	, South Korea; Solid; NR Notes: Asbestos-standard sample		
Temperature		NR				
System		LV100 polarizing microscope and refractive	index oil			
Standard Deviation Results		Not Reported				
Results Details		Not Reported				
Results Details Methods		Not Reported				
Parameter		Not Reported				
		E	EVALUATION	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2. Test Dalishili	<b>4</b>					
Domani 2. Test Kenadili	Notrio 2:	Poliobility/Unbiased	High	The methodology for moduling the information is designed to ensure a sub-if-		
	Metric 5.	(Mathad Objectivity)	nign	tion and the methodology's objective is clear		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
		, ,				
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	y Determina	ition	High			

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6860096 Table: 7 of 11

Study Citation:	Xu, X. M., Li, Y. Ferroelectrics 188	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated			
<b>OECD Harmonized</b>	Refractive Index	(1).150 117.			
Template: HERO ID:	6860096				
		]	EXTRACTIO	N	
Parameter		Data			
Refractive Index		1.680 - 1.692			
CASRN and Test Material		12001-28-4; Crocidolite			
Confidentiality, Type, and C	Juideline	None; Experimental; NA			
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	NA; Health and Safety Laboratory, UK and	d KTR laboratory	, South Korea; Solid; NR Notes: Asbestos-standard sample	
Temperature		NR			
System		Ly 100 polarizing microscope and refractiv	e index off		
Standard Deviation Results		Not Reported			
Results Details Mathada		Not Reported			
Parameter		Not Reported			
1 arameter		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Peliabili	its,				
Domain 2. Test Kendulli	Metric 3.	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific gues	
	Methe 5.	(Method Objectivity)	Ingn	tion and the methodology's objective is clear	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	y Determina	ation	High		

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6860096 Table: 8 of 11

Study Citation:	Xu, X. M., Li, Y.	Ku, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated				
OECD Harmonized	Refractive Index	(1):130-14/.				
Template:	(0(0))					
HERO ID:	6860096					
		E	EXTRACTIO	N		
Parameter		Data				
Refractive Index		1.596 - 1.654				
CASRN and Test Material	~	77536-67-5; Anthophyllite				
Confidentiality, Type, and C	Guideline	None; Experimental; NA				
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NA; Health and Safety Laboratory, UK and	KTR laboratory	y, South Korea; Solid; NR Notes: Asbestos-standard sample		
Temperature		NR				
System		LV100 polarizing microscope and refractive	e index oil			
Standard Deviation Results		Not Reported				
Results Details		Not Reported				
Results Details Methods		Not Reported				
Parameter		Not Reported				
				AT		
Domain		Metric	EVALUATIO Rating	Comments		
Domain 1: Substance		Wette	Rating	Comments		
Domain 1. Substance	Matric 1:	Dapresentativaness	High	Data are manyured for the subject chemical substance		
	Metric 2:	Appropriateness	N/A	Data are ineasured for the subject chemical substance.		
	Methe 2.	Appropriateness	IN/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
		(Method Objectivity)	e	tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 2. Other						
Domain 5: Other	Matria 5.	Detebases	Uiah	The information of data is from a magazized data collection/magazitem		
	wieuric 5:	Databases	пigli	The information of data is from a recognized data conection/repository where data are neer-reviewed by experts in the field, are broadly available to the public for review and		
				use OR includes references to the original sources		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	y Determina	ation	High			

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6860096 Table: 9 of 11

Study Citation:	Xu, X. M., Li, Y. Ferroelectrics 1880	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated				
<b>OECD Harmonized</b>	Refractive Index	1).130 117.				
Template: HERO ID:	6860096					
		E	XTRACTIO	N		
Parameter		Data				
Refractive Index		1.599 - 1.620				
CASRN and Test Material		77536-68-6; Tremolite				
Confidentiality, Type, and C	Juideline	None; Experimental; NA				
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NA; Health and Safety Laboratory, UK and	KTR laboratory	y, South Korea; Solid; NR Notes: Asbestos-standard sample		
Temperature		NR				
System		LV100 polarizing microscope and refractive	index oil			
Standard Deviation Results		Not Reported				
Results Details		Not Reported				
Results Details Methods		Not Reported				
Parameter		Not Reported				
			VALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance			U			
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
	Metric 4.	(Method Objectivity) Reliability/Analytical Method	High	Data are obtained by accented standard analytical methods		
	Medie 1.	Renability/ marytear Method	Ingn	Data are obtained by accepted standard analytical methods.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	y Determina	ation	High			

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

Study Citation:	Xu, X. M., Li,	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated				
OECD Harmonized	Refractive Inde	188(1):130-147. 2X				
HERO ID:	6860096					
			EXTRACTIO	DN		
Parameter		Data				
Refractive Index		1.622 - 1.641				
CASRN and Test Material		77536-68-6; Tremolite				
Confidentiality, Type, and	Guideline	None; Experimental; NA				
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State,	and Purity	NA; Health and Safety Laboratory, UK and	nd KTR laborator	y, South Korea; Solid; NR Notes: Asbestos-standard sample		
Temperature NR						
System LV100 polarizing microscope and refractive index oil						
Standard Deviation Results Not Reported						
Results Details		Not Reported				
Results Details Methods		Not Reported				
Parameter		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	lity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
		(Method Objectivity)		tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are		
			6	peer-reviewed by experts in the field, are broadly available to the public for review and		
				use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		

**Overall Quality Determination** 

High

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

Study Citation:	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G. (2018). Polarized light microscope method for the determination of asbestos fiber of textile. Integrated						
OECD Harmonized	Refractive Inde	188(1):136-147. ex					
Template: HERO ID:	6860096						
			EXTRACTIO	DN			
Parameter		Data					
Refractive Index		1.619 - 1.658					
CASRN and Test Material		77536-66-4; Actinolite					
Confidentiality, Type, and Confidentiality, and	Guideline	None; Experimental; NA					
Solvent, Reactivity, Storage, and Stability		NA; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NA; Health and Safety Laboratory, UK ar	nd KTR laborator	y, South Korea; Solid; NR Notes: Asbestos-standard sample			
Temperature		NR					
System		LV100 polarizing microscope and refracti	LV100 polarizing microscope and refractive index oil				
Standard Deviation Results		Not Reported					
Results Details		Not Reported					
Results Details Methods		Not Reported					
Parameter		Not Reponed					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Damain 2. Taat Daliahil	·						
Domain 2. Test Kellabil	Metric 2.	Reliability/Unbiased	Uich	The methodology for producing the information is designed to ensure a specific succ			
	Methe 5.	(Method Objectivity)	Ingn	tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.			
Domain 3: Other			/				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			

**Overall Quality Determination** 

High

Study Citation: OECD Harmonized	Zhong, Q., Liao, Z Refractive Index	Zhong, Q., Liao, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Black Nephrite Jade from Guangxi, Southern China. Gems & Gemology 55(2):198-215. Refractive Index					
HERO ID:	6880237						
		E	XTRACTIO	N			
Parameter		Data					
Refractive Index		1.625 - 1.645					
CASRN and Test Material		12172-67-7; Actinolite					
Confidentiality, Type, and G	Buideline	None; Experimental; Gemological properties	and mineral c	ompositions of black nephrite from Guangxi			
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, an	nd Purity	NR; NR; Solid; NR					
Temperature		Not reported					
System plate samples measured using a refractometer							
Standard Deviation Results	Deviation Results Not reported						
Results Details		8 samples containing 65->98% actinolite					
Results Details Methods		Not Reported					
Parameter		Not Reported					
		Ε	VALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabili	ty						
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-			
		(Method Objectivity)		tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.			
Domain 2. Other							
Domain 5: Other	Matria 5.	Databasas	NI/A	Define of this for the is not complicable to this himd of information			
	Matria 6:	DataDases Models	IN/A N/A	Raung of this factor is not applicable to this kind of information.			
	Metric 0:	Wodels	IN/A	kaung of this factor is not applicable to this kind of information.			
Overall Quality Determination High							

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Refractive Index

HERO ID: 6880237 Table: 2 of 2

Study Citation: OECD Harmonized	Zhong, Q., Liao, Refractive Index	, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Blac	k Nephrite Jade	from Guangxi, Southern China. Gems & Gemology 55(2):198-215.				
HERO ID:	6880237							
			EXTRACTIO	N				
Parameter		Data						
Refractive Index		1.647 - 1.650	1.647 - 1.650					
CASRN and Test Material		12172-67-7; Actinolite						
Confidentiality, Type, and C	Guideline	None; Experimental; Gemological proper	ties and mineral c	ompositions of black nephrite from Guangxi				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR						
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR						
Temperature		Not reported						
System		plate samples measured using a refractom	vlate samples measured using a refractometer					
Standard Deviation Results		Not reported						
Results Details		4 samples containing 60-99% ferro-actinolite						
Results Details Methods		Not Reported						
Parameter		Not Reported						
			EVALUATIO	N				
Domain		Metric	Rating	Comments				
Domain 1: Substance								
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.				
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.				
	_							
Domain 2: Test Reliabili	ity	5						
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-				
	Matria 4.	(Method Objectivity)	TT: _1-	non, and the methodology's objective is clear.				
	Metric 4:	Kenabinty/Anarytical Method	High	OECD guidelines for physical-chemical properties or other developed standard.				
Domain 3: Other								
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.				
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.				
Overall Qualit	y Determin	nation	High					

\_

Study Citation:	Keane, M. J., Stephens, J. W., Zhong, B. Z., Miller, W. E., Ong, T. M., Wallace, W. E. (1999). A study of the effect of chrysotile fiber surface composition						
OECD Harmonized	Nanomaterial Zeta						
Template:							
HERO ID:	3080916						
		EXTRACTION					
Parameter		Data					
Zeta		ca_lower -0.02 V (acid treated fibers; treated with 1 N HCl for 2h) - ca_upper +0.02 V (untreated fibers) Other					
CASRN and Test Material		12001-29-5; chrysotile asbestos					
Confidentiality, Type, and Guideline		none; Experimental; not specified					
Solvent, Reactivity, Storage	, and Stability	deionized H2O (Millipore); NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; National Institute of Environmental Health Sciences; solid; NR Notes: Intermediate-length chrysotile					
Isoelectric Value		not reported - not reported					
Standard Deviation, Mediu	m, and Remarks for	not reported; not reported; not reported					
Isoelectric Point	d Addition of Dotoile						
Method Type, Sampling, and Additional Details		other; not reported; not reported					
Instruments and Measurements Reproduced		Zeta-Meter ZM-80; not reported					
Standard Deviation not reported		not reported					
pH and Medium		5.0; deionized water					
Results Details		untreated fibers had a tendency to adhere to the side of the polystyrene containers, while the treated fibers formed large clumps in the middle of the vial.					

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

\_

\_\_\_\_

Study Citation:	Lavkulich, L. M., Schreier, H. E., Wilson, J. E. (2014). Effects of natural acids on surface properties of asbestos minerals and kaolinite. Journal of							
	Environmental Sci	Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering 49(6):617-624.						
OECD Harmonized	Nanomaterial Zeta	Nanomaterial Zeta						
Template:								
HERO ID:	3078027	3078027						
		EXTRACTION						
Parameter		Data						
Zeta		+21.5 mV/cm - Other						
CASRN and Test Material		12172-67-7; Actinolite						
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported						
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR						
Radiolabel, Source, State, a	and Purity	NA; VWR Int., Randor, PA, USA; Solid; NR Notes: Sample passed through a $< 63$ um stainless steel sieve and fine fraction retained for analysis						
Isoelectric Value		Not Reported						
Standard Deviation, Medi	um, and Remarks for	Not Reported; Not Reported; Not Reported						
Isoelectric Point								
Method Type, Sampling, and Additional Details		electrophoresis; Not Reported; Not Reported						
Instruments and Measurements Reproduced		Zeta Meter Model 3.0+; Mean of 5 samples						
Standard Deviation		Not Reported						
pH and Medium		NR; NR						
Results Details		Not Reported						

			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliab	ility				
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-	
		(Method Objectivity)		tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to	
				OECD guidelines for physical-chemical properties or other developed standard.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Quality Determination</b>			High		
Study Citation: OECD Harmonized	Light, W. G., Wei, E. T. (1977). Surface charge and hemolytic activity of asbestos. Environmental Research 13(1):135-145. Nanomaterial Zeta				
--	---	---	--	--	--
Template: HERO ID:	3084540				
		EXTRACTION			
Parameter		Data			
Zeta		+40.5 - +52.5 mV			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and C	Guideline	None; Experimental; NA			
Solvent, Reactivity, Storage	e, and Stability	Triple-distilled water; NR; NR; NR			
Radiolabel, Source, State, and Purity		NA; MRC Pneumoconiosis Unit, Pernarth, South Wales, and Johns-Manville Research and Development Center, Denver; Solid; NR Notes: DPPC added to aqueous suspensions, pH adjusted with HCl or NaOH, samples incubated for 1 day between 41 and 43 deg C in shaker bath and cooled to room temperature prior to use.			
Isoelectric Value		Not Reported			
Standard Deviation, Mediu	um, and Remarks for	Not Reported; Not Reported; Not Reported			
Isoelectric Point	d Additional Dataila	alastronkorraise Not Danartad. Not Danartad			
Method Type, Sampling, and Additional Details		microalactrophonesis, Not Reported, Not Reported			
instruments and Measurements Reproduced		25 fibers to traverse 1 ocular-microscope was recorded; electrophoretic mobility was determined, and the Zeta potential was calculated from this using the Helmholtz-Smoluchowski equation.			
Standard Deviation Not Reported		Not Reported			
pH and Medium		7.4; 100 mL distilled water with DPPC added, pH adjusted with HCl or NaOH.			
Results Details +40.5 and +52.5 mV for samples A and B					

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3084540 Table: 2 of 4

Study Citation: OECD Harmonized	Light, W. G., Wei, Nanomaterial Zeta	Light, W. G., Wei, E. T. (1977). Surface charge and hemolytic activity of asbestos. Environmental Research 13(1):135-145. Nanomaterial Zeta			
Template: HERO ID:	3084540				
		EXTRACTION			
Parameter		Data			
Zeta		-54.0 - mV			
CASRN and Test Material		17068-78-9; Anthophyllite			
Confidentiality, Type, and C	Guideline	None; Experimental; NA			
Solvent, Reactivity, Storage	e, and Stability	Triple-distilled water; NR; NR			
Radiolabel, Source, State, and Purity		NA; MRC Pneumoconiosis Unit, Pernarth, South Wales, and Johns-Manville Research and Development Center, Denver; Solid; NR Notes: DPPC added to aqueous suspensions, pH adjusted with HCl or NaOH, samples incubated for 1 day between 41 and 43 deg C in shaker bath and cooled to room temperature prior to use.			
Isoelectric Value		Not Reported			
Standard Deviation, Mediu	im, and Remarks for	Not Reported; Not Reported; Not Reported			
Isoelectric Point Method Type Sampling ar	nd Additional Details	electrophoresis: Not Reported: Not Reported			
Instruments and Measurements Reproduced		microelectrophoresis (Zeta Meter) and stereoscopic microscope.; Movement of fibers at least 0.1 um in size observed; the time required for 15 to 25 fibers to traverse 1 ocular-microscope was recorded; electrophoretic mobility was determined, and the Zeta potential was calculated from this using the Helmholtz-Smoluchowski equation			
Standard Deviation Not Reported		Not Reported			
pH and Medium		7.4; 100 mL distilled water with DPPC added, pH adjusted with HCl or NaOH.			
Results Details		Not Reported			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Relia	bility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qua	lity Determ	ination	High	
Over an Quanty Determination				

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3084540 Table: 3 of 4

Study Citation: OECD Harmonized	Light, W. G., Wei, E. T. (1977). Surface charge and hemolytic activity of asbestos. Environmental Research 13(1):135-145. Nanomaterial Zeta				
Template: HERO ID:	3084540				
		EXTRACTION			
Parameter		Data			
Zeta		-50.5 - mV			
CASRN and Test Material		12001-28-4; Crocidolite			
Confidentiality, Type, and C	Guideline	None; Experimental; NA			
Solvent, Reactivity, Storage	e, and Stability	Triple-distilled water; NR; NR; NR			
Radiolabel, Source, State, and Purity		NA; MRC Pneumoconiosis Unit, Pernarth, South Wales, and Johns-Manville Research and Development Center, Denver; Solid; NR Notes: DPPC added to aqueous suspensions, pH adjusted with HCl or NaOH, samples incubated for 1 day between 41 and 43 deg C in shaker bath and cooled to room temperature prior to use.			
Isoelectric Value		Not Reported			
Standard Deviation, Mediu	um, and Remarks for	Not Reported; Not Reported; Not Reported			
Isoelectric Point	d Additional Dataila	alastrophonosis, Nat Deported, Nat Deported			
Instruments and Measurem	ants Panroduced	microelectrophoresis, Not Reported, Not Reported			
instruments and measurements Reproduced		25 fibers to traverse 1 ocular-microscope was recorded; electrophoretic mobility was determined, and the Zeta potential was calculated from this using the Helmholtz-Smoluchowski equation.			
Standard Deviation Not Reported		Not Reported			
pH and Medium		7.4; 100 mL distilled water with DPPC added, pH adjusted with HCl or NaOH.			
Results Details		Not Reported			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to
				OECD guidelines for physical-chemical properties or other developed standard.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qual</b>	<b>Overall Quality Determination</b>			

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3084540 Table: 4 of 4

Study Citation: OECD Harmonized	Light, W. G., Wei, Nanomaterial Zeta	E. T. (1977). Surface charge and hemolytic activity of asbestos. Environmental Research 13(1):135-145.			
Template:					
<b>HERO ID:</b> 3084540					
		EXTRACTION			
Parameter		Data			
Zeta		-58.5 - mV			
CASRN and Test Material		12172-73-5; Amosite			
Confidentiality, Type, and C	Guideline	None; Experimental; NA			
Solvent, Reactivity, Storage	e, and Stability	Triple-distilled water; NR; NR; NR			
Radiolabel, Source, State, and Purity		NA; MRC Pneumoconiosis Unit, Pernarth, South Wales, and Johns-Manville Research and Development Center, Denver; Solid; NR Notes: DPPC added to aqueous suspensions, pH adjusted with HCl or NaOH, samples incubated for 1 day between 41 and 43 deg C in shaker bath and cooled			
		to room temperature prior to use.			
Isoelectric Value		Not Reported			
Standard Deviation, Mediu	im, and Remarks for	Not Reported; Not Reported; Not Reported			
Isoelectric Point Method Type, Sampling, an	d Additional Details	electrophoresis: Not Reported: Not Reported			
Instruments and Measurem	ents Reproduced	microelectrophoresis (Zeta Meter) and stereoscopic microscope · Movement of fibers at least 0.1 um in size observed: the time required for 15 to			
		25 fibers to traverse 1 ocular-microscope was recorded; electrophoretic mobility was determined, and the Zeta potential was calculated from this using the Helmholtz-Smoluchowski equation			
Standard Deviation		Not Reported			
pH and Medium		7.4; 100 mL distilled water with DPPC added, pH adjusted with HCl or NaOH.			
Results Details		Not Reported			
		1			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliab	ility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to
				OECD guidelines for physical-chemical properties or other developed standard.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quali</b>	<b>Overall Quality Determination</b>			

Study Citation: OECD Harmonized	Light, W. G., Wei, E. T. (1977). Surface charge and asbestos toxicity. Nature 265(5594):537-539. Nanomaterial Zeta				
Template: HERO ID:	3616568				
		EXTRACTION			
Parameter		Data			
Zeta		+34.0 mV (leached with Tyrode's solution for 21d) - +44.5 mV (unleached)			
CASRN and Test Material		12001-29-5; chrysotile A			
Confidentiality, Type, and C	Guideline	none; Experimental; not reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; reference sample from the International Union against Cancer; fibers; NR Notes: NR			
Isoelectric Value		not reported - not reported			
Standard Deviation, Mediu	um, and Remarks for	not reported; not reported; not reported			
Isoelectric Point Method Type, Sampling, and Additional Details		electrophoresis; not reported; Electrophoretic mobility measured using a microelectrophoresis instrument (Zeta-Meter) and zeta potential was approximated using the Helmholtz-Smoluchowski equation.			
Instruments and Measurements Reproduced		Zeta-meter; Electrophoretic mobility of fibres incubated for 2 hours as a $0.01\%$ (w/v) distilled-water suspension was measured using a microelec- trophoresis instrument (Zeta-Meter) and zeta potential was approximated using the Helmholtz-Smoluchowski equation.			
Standard Deviation		not reported			
pH and Medium		7.4; 0.01% (w/v) distilled water solution (2 hour incubation prior to analysis)			
Results Details Leaching time 1 day using mixtures 0.5% (w/v) suspensions in Tyrode's (physiological buffer) solution, 0.01M HCl or 0.1M HCl.		Leaching time 1 day using mixtures 0.5% (w/v) suspensions in Tyrode's (physiological buffer) solution, 0.01M HCl or 0.1M HCl.			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3616568 Table: 2 of 2

Study Citation: OECD Harmonized	Light, W. G., Wei, E. T. (1977). Surface charge and asbestos toxicity. Nature 265(5594):537-539. Nanomaterial Zeta				
Template:					
HERO ID: 3616568					
		EXTRACTION			
Parameter		Data			
Zeta		-43.5 mV (unleached) - +58.5 mV (leached with Tyrode's solution for 21d)			
CASRN and Test Material		12001-28-4; amphibole crocidolite			
Confidentiality, Type, and	Guideline	none; Experimental; not reported			
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR			
Radiolabel, Source, State, and Purity		NR; reference sample from the International Union against Cancer; fibers; NR Notes: NR			
Isoelectric Value		not reported - not reported			
Standard Deviation, Medi	um, and Remarks for	not reported; not reported; not reported			
Isoelectric Point					
Method Type, Sampling, a	nd Additional Details	electrophoresis; not reported; Electrophoretic mobility measured using a microelectrophoresis instrument (Zeta-Meter) and zeta potential was approximated using the Helmholtz-Smoluchowski equation.			
Instruments and Measurements Reproduced		Zeta-meter; Electrophoretic mobility of fibres incubated for 2 hours as a 0.01% (w/v) distilled-water suspension was measured using a microelec-			
		trophoresis instrument (Zeta-Meter) and zeta potential was approximated using the Helmholtz-Smoluchowski equation.			
Standard Deviation not repo		not reported			
pH and Medium		7.4; 0.01% (w/v) distilled water solution (2 hour incubation prior to analysis)			
Results Details		Leaching time 1 day using mixtures 0.5% (w/v) suspensions in Tyrode's (physiological buffer) solution, 0.01M HCl or 0.1M HCl.			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

Study Citation: OECD Harmonized Template: HERO ID:	NIH, (2016). Repo Nanomaterial Zeta	rt on carcinogens: Asbestos.		
	5762526	EVTDACTION		
Parameter		Data		
Zeta		Not specified - Not specified		
CASRN and Test Material		1332-21-4; chrysotile		
Confidentiality, Type, and C	Guideline	none; Not specified; Not Reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; occurs naturally; solid; NR Notes: NR		
Isoelectric Value		Not specified - Not specified		
Standard Deviation, Mediu	im, and Remarks for	Not specified; Not specified; Not specified		
Isoelectric Point Method Type, Sampling, and Additional Details		Not Reported; Not specified; Not specified		
Instruments and Measurements Reproduced		Not specified; Not specified		
Standard Deviation		Not specified		
pH and Medium		Not specified; Not specified		
Results Details		fibers have a net positive surface charge		

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Relial	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review, use and includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qual</b>	lity Determ	ination	High	

\* Related References: Cited sources (multiple sources cited) - IARC 1973, 1977, IPCS 1986

Study Citation: Pollastri, S., Gual Materials 276:469		ieri, A. F., Gualtieri, M. L., Hanuskova, M., Cavallo, A., Gaudino, G. (2014). The zeta potential of mineral fibres. Journal of Hazardous -479.		
<b>OECD Harmonized</b> Nanomaterial Zet				
Template:				
HERO ID:	3086336			
		EXTRACTION		
Parameter		Data		
Zeta		Zeta potential (mV) of short fibers in Gambles solution at $37^{\circ}$ C: $-17(\pm 4)$ , $-19(\pm 5)$ , and $-20(\pm 5)$ at pH 4.5, 5.5, and 7.0, respectively Zeta potential (mV) of long fibers in Gambles solution at $37^{\circ}$ C: $-15(\pm 5)$ , $-17(\pm 4)$ , and $-17(\pm 5)$ , at pH 4.5, 5.5, and 7.0, respectively.		
CASRN and Test Material		77536-88-6; Tremolite		
Confidentiality, Type, and C	Guideline	none; Experimental; Non-guideline		
Solvent, Reactivity, Storage	e, and Stability	Gamble's solution (concentration 0.1 wt%); NR; NR; NR		
Radiolabel, Source, State, and Purity		NR; Val d'Ala, Turin (Italy); samples were preliminary disaggregated in distilled water, using a common mechanical shredder; (Ca1.91Na0.06K0.01)1.98(Mg4.71Fe2+ 0.22Fe3+ 0.08Mn0.02)5.03(Si8.01Al0.02)8.03O22.14(OH)1.86 Notes: Short fiber samples: surface area = $9.2\pm3$ m2/g, fiber length = $11\pm1$ µm; long fiber samples: surface area = $0.66\pm2$ m2/g, fiber length = $78\pm1$ µm (determined using SEM)		
Isoelectric Value		Not reported - Not reported		
Standard Deviation, Mediu	um, and Remarks for	Not reported; Not reported; Not reported		
Isoelectric Point	1.1.1.2. 1.5. 1			
Method Type, Sampling, and Additional Details		electrophoresis; Not specified; zeta potential of long and short fiber size classes determined both in organic Gamble's modified solution at 25°C and 37°C, and pH 3-10.5 ( $\pm 0.2$ , pH adjusted using HCL and NaOH); triplicate measurements performed for several samples		
Instruments and Measurem	ents Reproduced	Zeta potential measured using a Zetasizer Nano Series instrument (Malvern); Not specified		
Standard Deviation		reported with values in parenthesis		
pH and Medium		pH range 3.0-11.0; Gamble's solution		
Results Details		Not Reported		

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Queli	ty Dotormi	ination	High	
Over all Quali	iy Determ	manon	nigii	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

Study Citation:	Pollastri, S., Gualti	eri, A. F., Gualtieri, M. L., Hanuskova, M., Cavallo, A., Gaudino, G. (2014). The zeta potential of mineral fibres. Journal of Hazardous
OECD Harmonized	Materials 276:469- Nanomaterial Zeta	479.
Template: HERO ID:	3086336	
		EXTRACTION
Parameter		Data
Zeta		Zeta potential (mV) of long fibers in water at $37^{\circ}C$ : $+26(\pm 2)$ , $+19(\pm 2)$ , $+10(\pm 3)$ , $+12(\pm 2)$ , $+8(\pm 3)$ , $+4(\pm 2)$ , and $-7(\pm 4)$ , at pH 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, and 10.0, respectively. Zeta potential (mV) of long fibers in water at $25^{\circ}C$ : $+29(\pm 3)$ , $+28(\pm 3)$ , $+17(\pm 3)$ , $+10(\pm 3)$ , $+7(\pm 4)$ , $+8(\pm 5)$ , and $-10(\pm 4)$ , at pH 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, and 10.0, respectively Zeta potential (mV) of long fibers in Gambles solution at $37^{\circ}C$ : $+4(\pm 2)$ , $-4(\pm 3)$ , $-8(\pm 3)$ , $-8(\pm 3)$ , $-18(\pm 5)$ and $-21(\pm 5)$ , at pH 3.0, 4.0, 4.5, 6.0, 7.0, 8.0, 10.0, and 11.0, respectively. Zeta potential (mV) of short fibers in Gambles solution at $37^{\circ}C$ : $-9(\pm 6)$ , $-12(\pm 3)$ , $-16(\pm 5)$ , $-20(\pm 2)$ , $-19(\pm 4)$ , $-18(\pm 2)$ , $-16(\pm 5)$ , $-22(\pm 4)$ , $-20(\pm 5)$ , $-20(\pm 4)$ , at pH 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.5, 7.0, 7.5, 8.0, 9.5, and 10.0, respectively.
CASRN and Test Material		12001-29-5; Chrysotile
Confidentiality, Type, and C	Guideline	none; Experimental; Non-guideline
Solvent, Reactivity, Storage	e, and Stability	double distilled water or Gamble's solution (concentration 0.1 wt%); NR; NR; NR
Radiolabel, Source, State, a	nd Purity	NR; Quebec (Canada): UICC standard Chrysotile "B" Canadian NB #4173-111-1; samples were preliminary disaggregated in distilled water, using a common mechanical shredder; (Mg5.93Fe2+ 0.11Al0.02Fe3+ 0.01)6.07Si4.03O10(OH)7.66 Notes: Short fiber samples: surface area = $42\pm1 \text{ m2/g}$ , fiber length = $5\pm2 \mu\text{m}$ ; long fiber samples: surface area = $29\pm1 \text{ m2/g}$ , fiber length = $99\pm5 \mu\text{m}$ (determined using SEM)
Standard Deviation Mediu	um and Remarks for	Not reported: Not reported: Not reported
Isoelectric Point Method Type, Sampling, an	nd Additional Details	electrophoresis; Not reported, Not reported electrophoresis; Not specified; zeta potential of long and short fiber size classes determined both in distilled water and in organic Gamble's modified solution at 25°C and 37°C, and pH 3-10.5 ( $\pm$ 0.2, pH adjusted using HCL and NaOH); triplicate measurements performed for several samples
Instruments and Measureme	ents Reproduced	Zeta potential measured using a Zetasizer Nano Series instrument (Malvern); Not specified
Standard Deviation		reported with values in parenthesis
pH and Medium		pH range 3.0-11.0; double distilled water or Gamble's solution
Results Details		Zeta potential (mV) in Gambles solution at 25°C and pH 4.0 of long fibers = $-8(\pm 4)$ .

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Continued on next page ...

PUBLIC RELEASE DRAF	T – DO NOT CITE OR QUOTE
Ap	oril 2024

Nanomaterial Zeta

HERO ID: 3086336 Table: 2 of 7

		continued from previous page	
Study Citation:	Pollastri, S., Gualtieri, A. F., Gualtieri, M. L., H	Hanuskova, M., Cavallo, A., Gaudino, G.	(2014). The zeta potential of mineral fibres. Journal of Hazardous
<b>OECD Harmonized</b>	Materials 276:469-479. Nanomaterial Zeta		
Template:			
HERO ID:	3086336		
		EVALUATION	
Domain	Metric	Rating	Comments
<b>Overall Quali</b>	ty Determination	High	

Study Citation: Pollastri, S., Gua		ieri, A. F., Gualtieri, M. L., Hanuskova, M., Cavallo, A., Gaudino, G. (2014). The zeta potential of mineral fibres. Journal of Hazardous
<b>OECD Harmonized</b>	Materials 276:469- Nanomaterial Zeta	-479.
Template:		
HERO ID:	3086336	
		EXTRACTION
Parameter		Data
Zeta		Zeta potential (mV) of short fibers in water at 37°C: $-16(\pm 3)$ , $-31(\pm 5)$ , $-34(\pm 5)$ , $-38(\pm 6)$ , $-34(\pm 4)$ , $-36(\pm 5)$ , $-37(\pm 4)$ , $-39(\pm 7)$ , $-37(\pm 4)$ , $-37(\pm 4)$ , $-37(\pm 5)$ , $-37(\pm 5)$ , $-39(\pm 5)$ , and $-42(\pm 5)$ , at pH 3.0, 4.0, 5.0, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 10.0, and 10.5, respectively. Zeta potential (mV) of short fibers in water at 25°C: $-16(\pm 4)$ , $-26(\pm 4)$ , $-32(\pm 4)$ , $-36(\pm 4)$ , $-38(\pm 5)$ , $-40(\pm 5)$ , $-43(\pm 7)$ , $-43(\pm 6)$ , $-45(\pm 6)$ , and $-48(\pm 6)$ , at pH 3.0, 4.0, 4.5, 5.0, 6.5, 7.0, 8.0, 9.0, 10.0 and 10.5, respectively Zeta potential (mV) of long fibers in Gambles solution at 37°C: $-20(\pm 4)$ , $-23(\pm 5)$ , $-22(\pm 4)$ , and $-20(\pm 6)$ , at pH 3.5, 4.5, 6.0, and 7.0, respectively. Zeta potential (mV) of short fibers in Gambles solution at 37°C: $-21(4)$ , $-23(\pm 4)$ , $-28(\pm 4)$ , $-21(\pm 4)$ , $-29(\pm 5)$ , $-28(\pm 4)$ , $-24(\pm 4)$ , $-31(\pm 4)$ , $-21(\pm 4)$ , $-30(\pm 3)$ , $-17(\pm 5)$ , and $-19(\pm 4)$ at pH 3.0. 3.5, 4.0, 4.5, 5.0, 5.5, 7.0, 7.5, 8.0, 8.5, 9.0, and 10.0, respectively.
CASRN and Test Material		12001-28-4; Crocidolite
Confidentiality, Type, and C	Guideline	none; Experimental; Non-guideline
Solvent, Reactivity, Storage	e, and Stability	double distilled water or Gamble's solution (concentration 0.1 wt%); NR; NR; NR
Radiolabel, Source, State, and Purity		NR; Koegas Mine, Northern Cape (South Africa): UICC standard Crocidolite South African NB #4173-111-3; samples were preliminary disaggregated in distilled water, using a common mechanical shredder; (Na1.96Ca0.03K0.01)2(Fe2+ 2.34Fe3+ 2.05Mg0.52)4.91(Si7.84A10.02)7.86O21.36(OH)2.64 Notes: Short fiber samples: surface area = $16.1\pm 6 \text{ m2/g}$ , fiber length = $6\pm 1 \mu \text{m}$ ; long fiber samples: surface area = $11.5\pm 4 \text{ m2/g}$ , fiber length = $30\pm 3 \mu \text{m}$ (determined using SEM)
Isoelectric Value		Not reported - Not reported
Standard Deviation, Medium, and Remarks for		Not reported; Not reported; Not reported
Isoelectric Point Method Type, Sampling, and Additional Details		electrophoresis; Not specified; zeta potential of long and short fiber size classes determined both in distilled water and in organic Gamble's modified solution at 25°C and 37°C, and pH 3-10.5 ( $\pm$ 0.2, pH adjusted using HCL and NaOH); triplicate measurements performed for several samples
Instruments and Measurem	ents Reproduced	Zeta potential measured using a Zetasizer Nano Series instrument (Malvern); Not specified
Standard Deviation		reported with values in parenthesis
pH and Medium		pH range 3.0-11.0; double distilled water or Gamble's solution
Results Details		Zeta potential (mV) in Gambles solution at 25°C and pH 4.5 of short fibers = $-26(\pm 5)$ .

	EVALUATION			
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques- tion and the methodology's objective is clear
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
	Continued on next page			

	PUBLIC F	RELEASE DRAFT – DO NOT CITE OI April 2024	R QUOTE	
estos		Nanomaterial Zeta	HERO ID: 3086336 Table:	: 3 of 7
		continued from previous page		_
Study Citation:	Pollastri, S., Gualtieri, A. F., Gualtieri, M. I Materials 276:460, 470	., Hanuskova, M., Cavallo, A., Gaudino, G. (2	014). The zeta potential of mineral fibres. Journal of Hazardous	-
<b>OECD Harmonized</b>	Nanomaterial Zeta			
Template:				
HERO ID:	3086336			
		EVALUATION		
Domain	Metric	Rating	Comments	
Overall Quali	ty Determination	High		-

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

Study Citation: Pollastri, S., G		ieri, A. F., Gualtieri, M. L., Hanuskova, M., Cavallo, A., Gaudino, G. (2014). The zeta potential of mineral fibres. Journal of Hazardous
OECD Harmonized	Naterials 2/6:469 Nanomaterial Zeta	-479.
Template:		
HERO ID:	3086336	
		EXTRACTION
Parameter		Data
Zeta		Zeta potential (mV) of long fibers in Gambles solution at 37°C: $-6(\pm 8)$ , $-5(\pm 3)$ , and $-15(\pm 3)$ , at pH 4.0, 4.5, and 7.0, respectively. Zeta potential (mV) of short fibers in Gambles solution at 37°C: $-15(\pm 6)$ , and $-17(\pm 4)$ at pH 4.5, and 7.0, respectively Zeta potential (mV) in Gambles solution at 25°C and pH 4.5 of long fibers = $-15(\pm 5)$ . Zeta potential (mV) in Gambles solution at 25°C and pH 4.5 of short fibers = $-15(\pm 5)$ .
CASRN and Test Material		$-20(\pm 4)$ . 77536-67-5; Anthophyllite
Confidentiality, Type, and	Guideline	none; Experimental; Non-guideline
Solvent, Reactivity, Storag	e, and Stability	Gamble's solution (concentration 0.1 wt%); NR; NR; NR
Radiolabel, Source, State, and Purity		NR; Paakkila mine, Paakkila (Finland): UICC standard Anthophylite Finnish NB #4173-111-5; samples were preliminary disaggregated in distilled water, using a common mechanical shredder; Ca0.04(Mg5.81Fe2+ 0.92Fe3+ 0.21Mn0.04)6.98(Si7.83Al0.02)7.85O21.63(OH)2.37 Notes: Short fiber samples: surface area = $14.4\pm5$ m2/g, fiber length = $17\pm2$ µm; long fiber samples: surface area = $4.4\pm2$ m2/g, fiber length = $95\pm9$ µm (determined using SEM)
Isoelectric Value		Not reported - Not reported
Standard Deviation, Medi	um, and Remarks for	Not reported; Not reported; Not reported
Isoelectric Point Method Type, Sampling, and Additional Details		electrophoresis; Not specified; zeta potential of long and short fiber size classes determined in organic Gamble's modified solution at 25°C and 37°C, and pH 3-10.5 (±0.2, pH adjusted using HCL and NaOH); triplicate measurements performed for several samples
Instruments and Measurem	nents Reproduced	Zeta potential measured using a Zetasizer Nano Series instrument (Malvern); Not specified
Standard Deviation	-	reported with values in parenthesis
pH and Medium		pH range 3.0-11.0; Gamble's solution
Results Details		Not Reported

EVALUATION				
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3086336 Table: 5 of 7

Study Citation:	Pollastri, S., Gualtieri, A. F., Gualtieri, M. L., Hanuskova, M., Cavallo, A., Gaudino, G. (2014). The zeta potential of mineral fibres. Journal of Hazardous			
<b>OECD Harmonized</b>	Naterials 276:469-479. Nanomaterial Zeta			
Template:				
HERO ID:	3086336			
		EXTRACTION		
Parameter		Data		
Zeta		Zeta potential (mV) of short fibers in Gambles solution at $37^{\circ}$ C: $-27(\pm 2)$ , $-27(\pm 3)$ , and $-23(\pm 2)$ , at pH 4.5, 5.5, and 7.0, respectively Zeta potential (mV) of long fibers in Gambles solution at $37^{\circ}$ C: $-26(\pm 4)$ , $-21(\pm 6)$ , and $-27(\pm 7)$ , at pH 4.5, 5.5, and 7.0, respectively.		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and G	uideline	none; Experimental; Non-guideline		
Solvent, Reactivity, Storage,	and Stability	Gamble's solution (concentration 0.1 wt%); NR; NR; NR		
Radiolabel, Source, State, and Purity		NR; Val Malenco, Sondrio (Italy); samples were preliminary disaggregated in distilled water, using a common mechanical shredder; (Mg5.85Fe2+ 0.11Al0.02Ni0.01)5.99Si4.01O10(OH)7.86 Notes: Short fiber samples: surface area = $68\pm9$ m2/g, fiber length = $10\pm5$ µm; long fiber samples: surface area = $45\pm2$ m2/g, fiber length = $160\pm9$ µm (determined using SEM)		
Isoelectric Value		Not reported - Not reported		
Standard Deviation, Mediur	m, and Remarks for	Not reported; Not reported; Not reported		
Isoelectric Point Method Type, Sampling, and Additional Details		electrophoresis; Not specified; zeta potential of long and short fiber size classes determined in organic Gamble's modified solution at 37°C, and pH 3-10.5 ( $\pm 0.2$ , pH adjusted using HCL and NaOH); triplicate measurements performed for several samples		
Instruments and Measurements Reproduced		Zeta potential measured using a Zetasizer Nano Series instrument (Malvern); Not specified		
Standard Deviation		reported with values in parenthesis		
pH and Medium		pH range 3.0-11.0; Gamble's solution		
Results Details		Not Reported		

EVALUATION					
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabi	lity				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted analytical methods.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Quality Determination</b>					

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3086336 Table: 6 of 7

Study Citation:	Pollastri, S., Gualti	Pollastri, S., Gualtieri, A. F., Gualtieri, M. L., Hanuskova, M., Cavallo, A., Gaudino, G. (2014). The zeta potential of mineral fibres. Journal of Hazardous			
OECD Harmonized	Materials 2/6:469- Nanomaterial Zeta	Materials 276:469-479. Nanomaterial Zeta			
Template: HERO ID:	3086336				
		EXTRACTION			
Parameter		Data			
Zeta		Zeta potential (mV) of short fibers in Gambles solution at $37^{\circ}$ C: $-27(\pm 3)$ , $-13(\pm 9)$ ,and $-27(\pm 3)$ , at pH 4.5, 5.5, and 7.0, respectively Zeta potential (mV) of long fibers in Gambles solution at $37^{\circ}$ C: $+1(\pm 5)$ , $-12(\pm 5)$ , $-18(\pm 5)$ , $-23(\pm 4)$ , $-19(\pm 5)$ , $-25(\pm 4)$ , $-16(\pm 2)$ , $-19(\pm 2)$ , $-17(\pm 4)$ , $-17(\pm 2)$ , $-15(\pm 2)$ , $-16(\pm 3)$ , and $-22(\pm 3)$ , at pH 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.5, 7.0, 7.5, 8.0, 9.0, 10.0, and 10.5, respectively.			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and C	Buideline	none; Experimental; Non-guideline			
Solvent, Reactivity, Storage	, and Stability	Gamble's solution (concentration 0.1 wt%); NR; NR; NR			
Radiolabel, Source, State, and Purity		NR; Chrysotile Balangero (Italy); samples were preliminary disaggregated in distilled water, using a common mechanical shredder; (Mg5.81Fe2+ 0.21Al0.27Fe3+ 0.03Cr0.01)6.33Si3.97O10(OH)7.11 Notes: Short fiber samples: surface area = $43\pm2$ m2/g, fiber length = $6\pm1$ µm; long fiber samples: surface area = $24.8\pm9$ m2/g, fiber length = $65\pm3$ µm (determined using SEM)			
Isoelectric Value		Not reported - Not reported			
Standard Deviation, Mediu	m, and Remarks for	Not reported; Not reported; Not reported			
Isoelectric Point Method Type, Sampling, and Additional Details		electrophoresis; Not specified; zeta potential of long and short fiber size classes determined in organic Gamble's modified solution at 37°C, and pH 3-10.5 ( $\pm$ 0.2, pH adjusted using HCL and NaOH); triplicate measurements performed for several samples			
Instruments and Measurements Reproduced		Zeta potential measured using a Zetasizer Nano Series instrument (Malvern); Not specified			
Standard Deviation		reported with values in parenthesis			
pH and Medium		pH range 3.0-11.0; Gamble's solution			
Results Details		Not Reported			

	EVALUATION					
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabi	lity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted analytical methods.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Quality Determination Hig						

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3086336 Table: 7 of 7

Study Citation:	Pollastri, S., Gualti Matariala 276:460	Pollastri, S., Gualtieri, A. F., Gualtieri, M. L., Hanuskova, M., Cavallo, A., Gaudino, G. (2014). The zeta potential of mineral fibres. Journal of Hazardous			
OECD Harmonized	Nanomaterial Zeta				
Template: HERO ID:	3086336				
		EXTRACTION			
Parameter		Data			
Zeta		Zeta potential (mV) of short fibers in Gambles solution at $37^{\circ}C$ : $-16(4)$ , $-19(\pm 4)$ , $-21(\pm 4)$ , $-20(\pm 5)$ , $-21(\pm 4)$ , $-21(\pm 4)$ , $-25(\pm 3)$ , $-21(\pm 7)$ , $-14(\pm 7)$ , $-15(\pm 6)$ , and $-18(\pm 5)$ at pH 3.0, 4.0, 4.5, 5.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, and 10.0, respectively Zeta potential (mV) of long fibers in Gambles solution at $37^{\circ}C$ : $-13(\pm 3)$ , $-24(\pm 5)$ , and			
CASRN and Test Material		Gambles solution at $37^{\circ}$ C: $-13(\pm 3)$ , $-23(\pm 8)$ , and $-24(\pm 5)$ , at pH 4.5, 5.5, and 7.0, respectively. 12172-73-5: Amosite			
Confidentiality, Type, and G	Guideline	none; Experimental; Non-guideline			
Solvent, Reactivity, Storage	, and Stability	Gamble's solution (concentration 0.1 wt%); NR; NR; NR			
Radiolabel, Source, State, and Purity		NR; Penge mine, Northern Province (South Africa); samples were preliminary disaggregated in distilled water, using a common mechanical shredder; (Ca0.02Na0.01)(Fe2+ 5.36Mg1.48Fe3+ 0.11Mn0.06)7.01(Si7.93Al0.01)7.94O21.94(OH)2.06 Notes: Short fiber samples: surface area = $9.5\pm3$ m2/g, fiber length = $7\pm2$ µm; long fiber samples: surface area = $3.9\pm1$ m2/g, fiber length = $125\pm9$ µm (determined using SEM)			
Isoelectric Value		Not reported			
Standard Deviation, Mediu	m, and Remarks for	Not reported; Not reported; Not reported			
Isoelectric Point Method Type, Sampling, and Additional Details		electrophoresis; Not specified; zeta potential of long and short fiber size classes determined in organic Gamble's modified solution at 25°C and $37^{\circ}$ C, and pH 3-10.5 (±0.2, pH adjusted using HCL and NaOH); triplicate measurements performed for several samples			
Instruments and Measurements Reproduced		Zeta potential measured using a Zetasizer Nano Series instrument (Malvern); Not specified			
Standard Deviation		reported with values in parenthesis			
pH and Medium		pH range 3.0-11.0; Gamble's solution			
Results Details		Not Reported			

	EVALUATION					
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliab	ility					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques- tion and the methodology's objective is clear		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted analytical methods.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Quality Determination High						

Study Citation: OECD Harmonized	Schiller, J. E., Payne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibres. Nanomaterial Zeta			
Template: HERO ID:	7475373			
		EXTRACTION		
Parameter		Data		
Zeta		ca_lower -59 - ca_upper -38 mV		
CASRN and Test Material		77536-67-5; anthophyllite asbestos		
Confidentiality, Type, and C	Juideline	none; Experimental; none		
Solvent, Reactivity, Storage, and Stability		distilled water; Not Reported; Not Reported; Not Reported		
Radiolabel, Source, State, and Purity		Not Reported; UICC International Union Against Canter; Origin: Finland; Not Reported; ACS reagent grade		
Isoelectric Value		Not Reported		
Standard Deviation, Mediu	m, and Remarks for	Not Reported; Not Reported; Not Reported		
Isoelectric Point Method Type, Sampling, and Additional Details		electrophoresis; zeta potential was calculated using the Helmholtz-Smoluchowski equation; microelectrophoresis		
Instruments and Measurements Reproduced		Zeta Meter cell; Only particles aligned axially to the electric field were timed, and the average electrophoretic mobility was calculated from the average velocity.		
Standard Deviation		Not Reported		
pH and Medium		5-9; distilled water		
Results Details		zeta potentials of fibrous asbestiform minerals from graph: ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta potential (mV) of blocky particles = $39\pm2$ and elongated particles = $49\pm2$ at pH 7		

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 7475373 Table: 2 of 4

Study Citation:	Schiller, J. E., Payr	ne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibres.		
OECD Harmonized	Nanomaterial Zeta			
Template:				
HERO ID:	7475373			
		EXTRACTION		
Parameter		Data		
Zeta		ca_lower -41 - ca_upper -20 mV		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	Guideline	none; Experimental; none		
Solvent, Reactivity, Storage	e, and Stability	distilled water; Not Reported; Not Reported; Not Reported		
Radiolabel, Source, State, a	and Purity	Not Reported; UICC International Union Against Cancer; Not Reported; ACS reagent grade		
Isoelectric Value		Not Reported		
Standard Deviation, Mediu	um, and Remarks for	Not Reported; Not Reported; Not Reported		
Isoelectric Point				
Method Type, Sampling, ar	nd Additional Details	electrophoresis; zeta potential was calculated using the Helmholtz-Smoluchowski equation; microelectrophoresis		
Instruments and Measurements Reproduced		Zeta Meter cell; Only particles aligned axially to the electric field were timed, and the average electrophoretic mobility was calculated from the average velocity.		
Standard Deviation		Not Reported		
pH and Medium		5-9; distilled water		
Results Details		zeta potentials of fibrous asbestiform minerals from graph: ca20, -32, -41, -40, and -41 at pH values of 5, 6, 7, 8, and 9, respectively; zeta potential (mV) of blocky particles = $28\pm1$ and elongated particles = $39\pm1$ at pH 7		

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination			High	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 7475373 Table: 3 of 4

Study Citation:	Schiller, J. E., Pay	ne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibres.		
OECD Harmonized	Nanomaterial Zeta			
Template:				
HERO ID:	7475373			
		EXTRACTION		
Parameter		Data		
Zeta		ca_lower -55 - ca_upper -25 mV		
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and	Guideline	none; Experimental; none		
Solvent, Reactivity, Storage	e, and Stability	distilled water; Not Reported; Not Reported; Not Reported		
Radiolabel, Source, State, a	and Purity	Not Reported; UICC International Union Against Canter; Origin: Africa; Not Reported; ACS reagent grade		
Isoelectric Value		Not Reported		
Standard Deviation, Medi	um, and Remarks for	Not Reported; Not Reported; Not Reported		
Isoelectric Point Method Type, Sampling, ar	nd Additional Details	electrophoresis; zeta potential was calculated using the Helmholtz-Smoluchowski equation; microelectrophoresis		
Instruments and Measurements Reproduced		Zeta Meter cell; Only particles aligned axially to the electric field were timed, and the average electrophoretic mobility was calculated from the average velocity.		
Standard Deviation		Not Reported		
pH and Medium		5-9; distilled water		
Results Details		zeta potentials of fibrous asbestiform minerals from graph: ca25, -35, -36, -50, and -55 at pH values of 5, 6, 7, 8, and 9, respectively; zeta potential (mV) of blocky particles = $24\pm3$ and elongated particles = $37\pm2$ at pH 7		

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>		High		

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 7475373 Table: 4 of 4

Study Citation: OECD Harmonized	Schiller, J. E., Pay Nanomaterial Zeta	Schiller, J. E., Payne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibres.				
Template:						
HERO ID:	7475373					
		EXTRACTION				
Parameter		Data				
Zeta		ca_lower -46 (India); -50 (Switzerland) - ca_upper -32(India); -36 (Switzerland) mV				
CASRN and Test Material		77536-68-6; tremolite asbestos				
Confidentiality, Type, and	Guideline	none; Experimental; none				
Solvent, Reactivity, Storag	e, and Stability	distilled water; Not Reported; Not Reported; Not Reported				
Radiolabel, Source, State, and Purity		Not Reported; BuMines - Origin: India; University of Minnesota, Minneapolis, Minn - Origin: Switzerland; Not Reported; ACS reagent grade				
Isoelectric Value		Not Reported				
Standard Deviation, Medi	um, and Remarks for	Not Reported; Not Reported; Not Reported				
Isoelectric Point						
Method Type, Sampling, a	nd Additional Details	electrophoresis; zeta potential was calculated using the Helmholtz-Smoluchowski equation; microelectrophoresis				
Instruments and Measurem	nents Reproduced	Zeta Meter cell; Only particles aligned axially to the electric field were timed, and the average electrophoretic mobility was calculated from the average velocity.				
Standard Deviation		Not Reported				
pH and Medium		5-9; distilled water				
Results Details		zeta potentials of fibrous asbestiform minerals from graph (India): ca32, -36, -42, -44, and -46 at pH values of 5, 6, 7, 8, and 9, respectively; zeta potentials of fibrous asbestiform minerals from graph (Switzerland): ca36, -42, -46, -45, and -50 at pH values of 5, 6, 7, 8, and 9, respectively; zeta potential (mV) of blocky particles = $24\pm1$ and elongated particles = $35\pm3$ at pH 7 (Switzerland)				

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliab	oility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3975020 Table: 1 of 3

Study Citation: OECD Harmonized	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses. Nanomaterial Zeta						
Template:							
HERO ID:	3975020						
	EXTRACTION						
Parameter		Data					
Zeta		+13.6 - +54					
CASRN and Test Material		1332-21-4; Chrysotile					
Confidentiality, Type, and C	Guideline	None; Experimental; NR					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR					
Isoelectric Value		NR - 11.8					
Standard Deviation, Mediu Isoelectric Point	im, and Remarks for	Not Reported; No	rted				
Method Type, Sampling, an	d Additional Details	Not Reported; NR; NR					
Instruments and Measureme	ents Reproduced	NR; NR					
Standard Deviation		Not Reported					
pH and Medium		NR; NR					
Results Details		Values become negative after weatherin	g and/or leaching.				
D .			EVALUATION	N			
Domain		Metric	Rating	Comments			
Domain I: Substance	36.1.4	<b>D</b>					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabili	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.			
Domain 3: Other							
Domain 5. Outer	Metric 5:	Databases	NI/A	Pating of this factor is not applicable to this kind of information			
	Metric 6:	Models	IN/A NI/A	Rating of this factor is not applicable to this kind of information.			
	within 0.	11100015	11/74	Kating of tins factor is not applicable to tins knitt of information.			
<b>Overall Qualit</b>	y Determina	ation	High				

\* Related References: No citations reported.

#### PUBLIC RELEASE DRAFT - DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3975020 Table: 2 of 3

Study Citation: OECD Harmonized	USGS, (2002). As Nanomaterial Zeta	bestos: Geology, mineralogy, mining,	and uses.				
Template:							
HERO ID:	3975020						
			EXTRACTIO	N			
Parameter		Data					
Zeta		-2040					
CASRN and Test Material		12172-73-5; Amosite					
Confidentiality, Type, and C	Guideline	None; Experimental; NR					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR					
Isoelectric Value		NR -					
Standard Deviation, Mediu	um, and Remarks for	Not Reported; Not Reported; Not Report	ted				
Isoelectric Point Method Type, Sampling, ar	nd Additional Details	Not Reported; NR; NR					
Instruments and Measurem	ents Reproduced	NR; NR					
Standard Deviation	-	Not Reported					
pH and Medium		NR; NR					
Results Details		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2 <sup>.</sup> Test Reliabil	ity						
2 smain 2. Test Rendon	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	intenie 5.	(Method Objectivity)	meanann	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's			

**Overall Quality Determination** 

Domain 3: Other

Metric 5:

Metric 6:

Databases

Models

High

N/A

N/A

inclusion in a peer-reviewed/recognized database or other secondary source.

Rating of this factor is not applicable to this kind of information.

Rating of this factor is not applicable to this kind of information.

\* Related References: No citations reported.

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Nanomaterial Zeta

HERO ID: 3975020 Table: 3 of 3

Study Citation: OECD Harmonized	USGS, (2002). As Nanomaterial Zeta	bestos: Geology, mineralogy, mining,	and uses.				
Template:							
HERO ID:	3975020						
			EXTRACTIO	N			
Parameter		Data					
Zeta		-32 -					
CASRN and Test Material		12001-28-4; Crocidolite					
Confidentiality, Type, and C	Guideline	None; Experimental; NR					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR					
Isoelectric Value		NR -					
Standard Deviation, Mediu	im, and Remarks for	Not Reported; Not Reported; Not Reported					
Isoelectric Point Method Type Sampling ar	d Additional Details	Not Reported: NR · NR					
Instruments and Measurem	ents Reproduced	ND ND					
Standard Deviation	ents Reproduced	Not Reported					
pH and Medium							
Paralle Details		Not Reported					
Results Details		Not Reported					
			FVAL HATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance			6				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
				- **			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's			

Domain 3: Other

# **Overall Quality Determination**

Metric 5:

Metric 6:

Databases

Models

High

N/A

N/A

inclusion in a peer-reviewed/recognized database or other secondary source.

Rating of this factor is not applicable to this kind of information.

Rating of this factor is not applicable to this kind of information.

\* Related References: No citations reported.

Study Citation:	Vidovic, K., Lovrecek, B., Hraste, M. (1996). Influence of surface charge on sedimentation and filtration behaviour of fibrous material. Chemical and Biochemical Engineering Quarterly 10(1):33-38.				
OECD Harmonized	Nanomaterial Zeta				
Template:					
HERO ID:	3584063				
		EXTRACTION			
Parameter		Data			
Zeta		-1 mV (approx) - 7.5 mV (approx)			
CASRN and Test Material		12001-29-5; chrysotile			
Confidentiality, Type, and	Guideline	None; Experimental; 'a standard experimental arrangement and test procedure' citing several sources			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; P-5-50; Ural Mines, Russia; fibrous solid; Grade 5Z (Asbestos Textile Institute (USA) and Quebec Asbestos Mining Association (Canada))			
Lesslesses Males		Notes: NA			
		9 - ca_upper			
Standard Deviation, Media	um, and Remarks for	Not Reported; water; Not Reported			
Method Type, Sampling, ar	nd Additional Details	electrophoresis; NR; thermostated at 298K			
Instruments and Measurem	ents Reproduced	Lab instrument contained an electroosmotic cell, membrane, Pt electrode, measuring capillary, ampmeter, voltmeter, conductometer and thermo-			
Standard Deviation		stat, INA +/-1 mV (approximate from figure)			
nH and Medium		2 to 12. Water			
Results Details		$\Delta n prox 7.5 \text{ mV}$ at $n H.2$ and $-1 \text{ mV}$ at $n H.12$			
Results Details		Approx 7.5 mV at pri 2 and -1 mV at pri 12			

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabi	ility					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	Data are obtained by accepted standard analytical methods, but some details are not reported and only cite secondary sources.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

Study Citation:	Wu, L., Ortiz, C. P., Jerolmack, D. J. (2017). Aggregation of Elongated Colloids in Water. Langmuir 33(2):622-629.					
OECD Harmonized	Nanomaterial Zeta					
	2521569					
HERO ID:	5551508					
		EXTRACTION				
Parameter		Data				
Zeta		ca_lower -14 - ca_upper 5.0				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and	Guideline	None; Experimental; NA				
Solvent, Reactivity, Storag	e, and Stability	NA; NR; NR				
Radiolabel, Source, State,	and Purity	NA; El Dorado Mine, Salt River, Arizona; Solid block; > 90%				
Isoelectric Value		4 - 5				
Standard Deviation, Medin Isoelectric Point	um, and Remarks for	NR; 150 ppm (nominal) test substance in water, dispersed by sonication, pH adjusted with HCl; Dilute acid treated values in this study lower than values reported elsewhere.				
Method Type, Sampling, an	nd Additional Details	electrophoresis; NR; Zeta potential determined from electrophoretic mobility using the Smoluchowski approximation.				
Instruments and Measurements Reproduced		Delsa Nano C; NR				
Standard Deviation		Not Reported				
pH and Medium		3.6, ~4.4, ~5.1, ~5.6, ~6.1, ~6.9, ~7.5, 8.0; 150 ppm (nominal) test substance in water, dispersed by sonication, pH adjusted with HCl				
Results Details		Values estimated from figure. ~5.0 at pH 3.6, ~2.2 at pH ~4.4, ~-1.8 at pH ~5.1, ~-5.7 at pH ~5.6, ~-7.9 at pH ~6.1, ~-12 at pH ~6.9, ~-13 at pH ~7.5, and ~-14 at pH 8.0				

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliability						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology was appropriate.		
	Metric 4:	Reliability/Analytical Method	High	The analytical method was appropriate.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Data are measured for the subject chemical substance.		
Overall Quality Determination E			High			

Study Citation: OECD Harmonized	Elsevier, (2021). Dielectric Const	Reaxys: physical-chemical property data	ata for Chrysotile.	
HERO ID:	7924810			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material Confidentiality, Type, and C Solvent, Reactivity, Storage Radiolabel, Source, State, a Dielectric Constant Temperature System Results Value Results Details	Guideline e, and Stability nd Purity	12001-29-5; Chrysotile None; Experimental; Not Reported NR; NR; NR; NR NR; NR; Solid; NR 800 - Not Reported Not Reported Not Reported at 25°C 1 value reported in Reaxys		
Results Details		at 25 C. 1 value reported in Reaxys.		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	Matria 1.	Demagentativeness	High	Determined for the arthress them is a metermined with the sec
	Metric 2:	Appropriateness	N/A	Bating of this factor is not applicable to this kind of information
		rppropriateness	1 1/1 1	Rung of this factor is not appreade to this kind of information.
Domain 2: Test Reliabili	ity Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are
	Lieure 9.		mgn	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	High	

\* Related References: Datta; Bhattacherjee; Journal of Materials Science; vol. 21; nb. 3; (1986); p. 1041 - 1045

Study Citation: OECD Harmonized	Elsevier, (2021). Dielectric Const	Reaxys: physical-chemical property da ant	ta for Tremolite.	
Template:	7024014			
HERO ID:	/924814			
			EXTRACTIO	N
Parameter		Data		
		145(7 72 0 5 1)		
CASKN and Test Material	5	1456/-/3-8; Iremolite		
Confidentiality, Type, and C		None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NK; NK; NK; NK		
Radiolabel, Source, State, a	ind Purity	NK; NK; Solid; NK		
Dielectric Constant		7.03 20. day C		
Temperature		20 deg C		
System		Not Reported		
Results value		Not Reported		an shadardad. Calla stadara'as the same terms 'terms lite' in Deserve
Results Details		powdered tremonte at 20°C; 1 value repo	orted in Reaxys.; m	ononydrated. Collected using the search term tremonte in Reaxys.
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determi	nation	High	

\* Related References: Rosenholtz, J. L.; Smith, D. T.; American Mineralogist; vol. 21; (1936); p. 115 - 120; Gmelin Handbuch der Anorganischen Chemie; vol. Ca: MVol.B3; 316, page 1376 - 1378

\_

\_

Study Citation:	Addison, W. E., Neal, G. H., Sharp, J. H., White, A. D. (1966). Amphiboles. Part IV. Surface properties of amosite and crocidolite. Journal of the Chemical			
<b>OECD Harmonized</b>	Other Properties	A: Inorganic, Physical, and Theoretical C	hemistry 1966:/9-81	
Template:	1			
HERO ID:	3827309			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Juideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; Johns Manville Research Centre from	Jeffery Mine, Quebec,	CAN.; NR; NR
Results Value	Surface area: 13.5 - 22.4 m^2/g @ 25°C			
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance		hiduld	Runng	Commonts
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ty			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Matria 4.	(Method Objectivity)	Madium	towards a particular product or outcome.
	Metric 4:	Kenabinty/Analytical Method	Medium	inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	ation	Medium	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

HERO ID: 3827309 Table: 2 of 3

Study Citation:	Addison, W. E.,	Addison, W. E., Neal, G. H., Sharp, J. H., White, A. D. (1966). Amphiboles. Part IV. Surface properties of amosite and crocidolite. Journal of the Chemical			
OECD Harmonized	Other Properties				
Template:	2827200				
	3827309				
D		E	XTRACTION		
Parameter		Data			
CASRN and Test Material		12172-73-5; Amosite			
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; Cape Asbestos Co. Ltd.; NR; NR			
Results Value		Surface area: 2.25 - 7.10 m^2/g @ 25°C			
Results Details		Not Reported			
Results Remarks		Not Reported			
		E	VALUATION		
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	ty Determi	nation	Medium		

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

HERO ID: 3827309 Table: 3 of 3

Study Citation:	Addison, W. E.,	Neal, G. H., Sharp, J. H., White, A. D. (1966)	). Amphiboles. Pa	rt IV. Surface properties of amosite and crocidolite. Journal of the Chemical
OECD Harmonized	Society. Section A: Inorganic, Physical, and Theoretical Chemistry 1966: 79-81. Other Properties			
Template:	· · · · · · · · · · · · · · · ·	-		
HERO ID:	3827309			
		EX	TRACTION	
Parameter		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; Cape Asbestos Co. Ltd.; NR; NR		
Results Value		Surface area: 4.62 - 14.80 m^2/g @ 25°C		
Results Details		Not Reported		
Results Remarks		Not Reported		
		E	VALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties					
HERO ID:	3827307					
EXTRACTION						
Parameter		Data				
CASRN and Test Material		12172-73-5; Amosite				
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR				
Results Value		Tensile strength: 110 - 620 Mpa (16,000	- 90,000 lb./in.^2)			
Results Details		Not Reported				
Results Remarks		Not Reported				
			EVALUATION			
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Quality Determination Medium						

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

Study Citation: OECD Harmonized	m: Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties			ctions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template:	ouler i ropertie	5		
HERO ID:	3827307			
	002/00/		DWDD ( CTION	
Description		Dete	EXTRACTION	
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Optical properties: Biaxial positive paralle	el extinction	
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Demain 2. Test Delishil	:4			
Domain 2: Test Kellabil	Illy Matria 2		Madium	
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Matria 4.	(Method Objectivity)	Madium	
	Metric 4:	Reliability/Analytical Method	Medium	inclusion in a peer-reviewed/recognized database or other secondary source
				inclusion in a peer reviewed/recognized database of other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
			N/ - J*-	
Overall Qualit	ty Determi	nation	Niedium	

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

Study Citation: OECD Harmonized	Itation: Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.   Iarmonized Other Properties			ctions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template:	1			
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Optical properties: Biaxial positive paralle	el extinction	
Results Details		Not Reported		
Results Remarks		Not Reported		
			FVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance		moune	Itating	Commonds
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
		** *		• • • • • • • • • • • • • • • • • • • •
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination Medium				

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties			
Template:	Other i ropertie	5		
HERO ID:	3827307			
	002/00/			
Demonster		Data	EXTRACTION	
Parameter		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Optical properties: Biaxial $\pm$ extinction in	clined	
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
Domain 2. Test Kendon	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Weute 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
			1110 01 0111	inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination Medium				

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

HERO ID: 3827307 Table: 5 of 36

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties						
Template:	ould Properties	,					
HERO ID.	3827307						
	5027507						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		12001-29-5; Chrysotile					
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR					
Results Value	•	Tensile strength: 550 - 690 Mpa (80,000 -	100,000 lb./in.^2)				
Results Details		Not Reported					
Results Remarks		Not Reported					
		*					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabili	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's			
				inclusion in a peer-reviewed/recognized database or other secondary source.			
Domain 3: Other							
2 sinuin 31 outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	y Determi	nation	Medium				

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

HERO ID: 3827307 Table: 6 of 36

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties						
Template.	other rioperties	,					
HERO ID.	3827307						
	3027307						
_	EXTRACTION						
Parameter		Data					
CASRN and Test Material		12001-28-4; Crocidolite					
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR					
Results Value	•	Tensile strength: 690 - 2100 Mpa (100,00	0 - 300,000 lb./in.^2)				
Results Details		Not Reported					
Results Remarks		Not Reported					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
	•						
Domain 2: Test Reliabili	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	M-4	(Method Objectivity)	Madisse	towards a particular product or outcome.			
	Metric 4:	Renability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.			
				inclusion in a peer reviewed recognized database of other secondary source.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Qualit	ty Determi	nation	Medium				
Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties						
------------------------------------	---	--	------------	--			
Template.	Other Properties	5					
HERO ID:	3827307						
	002/00/	-					
Demonster		Data E	EXTRACTION				
Parameter		Data					
CASRN and Test Material		77536-67-5; Anthophyllite					
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR					
Results Value		Essential composition: Mg silicate with iron	1				
Results Details		Not Reported					
Results Remarks		Not Reported					
		Η	EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	ity						
Domain 2, Test Kellabil	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	Methe 5.	(Method Objectivity)	Wiedrum	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's			
				inclusion in a peer-reviewed/recognized database or other secondary source.			
Demeir 2. Other							
Domain 3: Other	Matula 5.	Detaharan	NT/A				
	Nietric 5:	Databases	IN/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	wodels	N/A	kating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	ty Determi	nation	Medium				

Study Citation: OECD Harmonized	Badollet, M. S. Other Properties	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties				
Template:	o unor risperate	~				
HERO ID:	3827307					
			EXTRACTION			
Parameter		Data				
CASRN and Test Material		77536-66-4; Actinolite				
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR				
Results Value	-	Essential composition: Ca, Mg, Fe silicate	e with water up to 5%			
Results Details		Not Reported	*			
Results Remarks		Not Reported				
			EVALUATION			
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other						
Domain 5. Outer	Metric 5	Databases	N/A	Rating of this factor is not applicable to this kind of information		
	Metric 6	Models	N/A	Rating of this factor is not applicable to this kind of information.		
	metrie 6.		11/11	Running of this factor is not approache to this kind of information.		
<b>Overall Qualit</b>	ty Determi	nation	Medium			

Study Citation: OECD Harmonized Template:	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalle	led properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.		
HERO ID:	3827307					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material	a	//536-6/-5; Anthophyllite				
Confidentiality, Type, and C	Juideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NK; NK; NK; NK				
Results Value		Luster: vitreous to pearly				
Results Details		Not Reported				
Results Remarks		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance			-			
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2. Test Reliabil	itv					
Domain 2. Test Renabil	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)	1110010111	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
2 childin 51 Other	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
		_				
<b>Overall Qualit</b>	ty Determi	nation	High			

Study Citation: OECD Harmonized	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparallel	led properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.	
HERO ID:	3827307				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material	a	7/536-66-4; Actinolite			
Confidentiality, Type, and C		None; Experimental; Not Reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NK; NK; NK; NK			
Results Value		Luster: silky			
Results Details		Not Reported			
Results Remarks		Not Reported			
				AT	
Domain		Matria	EVALUATIO	Comments	
Domain 1. Substance		Metric	Kating	Comments	
Domain 1: Substance	Matria 1.	Depresentativeness	Uich	Data are many and for the sphingt sharping other	
	Metric 2:	Appropriateness	nigii N/A	Data are measured for the subject chemical substance.	
	Wieute 2.	Appropriateness	IN/A	Kating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
		(Method Objectivity)		towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Over					
Overall Quality	ly Determi	nation	High		

Study Citation: OECD Harmonized Template:	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalles	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		77536-67-5; Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Mohs hardness: 5.5 - 6.0		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	t <b>y Determi</b>	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalle s	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		77536-66-4; Actinolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Mohs hardness: 6.0+/-		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance			-	
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	Medium	

Study Citation: OECD Harmonized Template:	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalles	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		77536-67-5; Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Specific gravity: 2.85 - 3.1		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	Medium	

Study Citation: OECD Harmonized Template:	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalle	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		77536-66-4; Actinolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Specific gravity: 3.0 - 3.2		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparallelos	ed properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		77536-67-5; Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Value		Optical properties: Biaxial positive extine	ction parallel	
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
Domain 2. Test Rendom	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Weate 5.	(Method Objectivity)	Wiedrum	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6	Models	N/A	Rating of this factor is not applicable to this kind of information.
	menie 0.	1100015	11/11	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties			
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASKN and Test Material	Zuidalina	//536-66-4; Actinolite		
Solvent Reactivity Storage	and Stability	ND. ND. ND. ND		
Radiolabel Source State a	and Purity	NR · NR · NR · NR		
Results Value	and I unity	Optical properties: Biaxial negative extin	ction inclined	
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	Medium	

Study Citation: OECD Harmonized Template:	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalleles	d properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		77536-67-5; Anthophyllite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Value		Tensile strength: $\leq$ 30 Mpa ( $\leq$ 4,000 lb./ir	n.^2)	
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalleled p	roperties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.	
Template: HERO ID:	3827307				
	5627567				
Doromotor		E2	ATRACTION		
		Data			
CACDN and Track Material		77526 66 4. 4 - 41 114-			
CASKIN and Test Material	"wideline	//550-00-4; Actinonite Noney Experimental, Not Deported			
Solvent Beastivity Storage	and Stability	Note, Experimental, Not Reported			
Padialabel Source State	, and Stability	NR, NR, NR, NR ND· ND· ND			
Results Value	ind I drity	Tensile strength: $< 7$ Mpa ( $< 1000$ lb /in $^{2}$ )			
Results Details		Not Reported			
Results Remarks		Not Reported			
		E	VALUATION		
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2. Toot Daliahili	<b></b>				
Domain 2: Test Renadin	Metric 3:	Paliability/Unbiased	Madium	There is no indication that the methodology for producing the information was biased	
	Metric 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's	
		<u> </u>		inclusion in a peer-reviewed/recognized database or other secondary source.	
Demain 2. Other					
Domain 5: Other	Matric 5:	Databases	N/A	Dating of this faster is not applicable to this kind of information	
	Metric 5:	Models	N/A N/A	Rating of this factor is not applicable to this kind of information.	
	Methe 0.	1100013	11/17	Kating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	y Determi	nation	Medium		

Study Citation: OECD Harmonized Template:	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties			
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Value		Essential composition: Mg silicate with s	ome water	
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
2 childin 51 Outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties					
Template:						
HERO ID:	3827307					
	2027207					
<b>D</b>	EXTRACTION					
Parameter		Data				
CASRN and Test Material		12172-73-5; Amosite				
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR				
Results Value		Essential composition: Fe, Mg silicate				
Results Details		Not Reported				
Results Remarks		Not Reported				
			EVALUATION			
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
	•.					
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	M-4	(Method Objectivity)	Madium	towards a particular product of outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	inclusion in a peer-reviewed/recognized database or other secondary source		
				inclusion in a peer reviewed recognized database of other secondary source.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
				- **		
<b>Overall Qualit</b>	y Determi	nation	Medium			

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties					
HERO ID:	3827307					
			EXTRACTION			
Parameter		Data				
CASRN and Test Material		12001-28-4; Crocidolite				
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR				
Results Value		Essential composition: Na, Fe silicate wit	h some water			
Results Details		Not Reported				
Results Remarks		Not Reported				
			EVALUATION	_		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other	Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	y Determi	nation	Medium			

Study Citation: OECD Harmonized	Badollet, M. S. ( Other Properties	(1951). Asbestos, a mineral of unparalle	led properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5: Chrysotile		
Confidentiality Type, and C	Guideline	None: Experimental: Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR: NR: NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Luster: silky		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATIO	Ň
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
Domain 2. Test Kendom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determin	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. ( Other Properties	1951). Asbestos, a mineral of unparallel	led properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material	~	12172-73-5; Amosite		
Confidentiality, Type, and C	Juideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	ind Purity	NR; NR; NR; NR		
Results Value		Luster: vitreous to somewhat pearly		
Results Details		Not Reported		
Results Remarks		Not Reported		
Demain		Matria	E VALUATIO	Commente
Domain Domain		Metric	Kating	Comments
Domain 1: Substance	Matria 1	Depresentativeness	Uiah	Date are many and for the subject shaming substance
	Metric 7:	Appropriateness	nigii N/A	Data are measured for the subject chemical substance.
	Metric 2.	Appropriateness	IN/A	
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 5: Other	Matria 5.	Detabases	NI/A	Dating of this factor is not applicable to this kind of information
	Metric 5: Matria 6:	Databases	IN/A	Rating of this factor is not applicable to this kind of information.
	wieuric o:	WIGUEIS	IN/A	kating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determir	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparallel	led properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.	
HERO ID:	3827307				
			EXTRACTIO	N	
Parameter		Data			
CASPN and Test Material		12001 28 4. Crosidalita			
CASKIN and Test Material	Juideline	None: Experimental: Not Reported			
Solvent Reactivity Storage	and Stability	NR · NR · NR · NR			
Radiolabel Source State a	and Purity	NR · NR · NR · NR			
Results Value	and I unity	Luster: silky to dull			
Results Details		Not Reported			
Results Remarks		Not Reported			
		1			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
Domain 2. Test Kendon	Metric 3.	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
	Weate 5.	(Method Objectivity)	Wiedium	towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	Overall Quality Determination High				

Study Citation: OECD Harmonized Template:	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalle s	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Mohs hardness: 2.5 - 4.0		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalle s	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Mohs hardness: 5.5 - 6.0		
Results Details		Not Reported		
Results Remarks		Not Reported		
Domain		Matria	EVALUATION	Commonto
Domain 1. Substance		Metric	Katilig	Comments
Domain 1: Substance	Matria 1.	Depresentativeness	Uich	Date are many used for the subject chamical substance
	Metric 1.	Appropriatopage	nigii N/A	Data are measured for the subject chemical substance.
	Metric 2.	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>		Medium		

Study Citation: OECD Harmonized	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalle s	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Mohs hardness: 4.0		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			Medium	

Study Citation: OECD Harmonized Template:	Badollet, M. S. ( Other Properties	(1951). Asbestos, a mineral of unparalle	eled properties. Transact	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material	~	12001-29-5; Chrysotile		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	ind Purity	NR; NR; NR; NR		
Results Value		Specific gravity: 2.4 - 2.6		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	nation	Medium	

Study Citation: OECD Harmonized Template:	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalle s	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Specific gravity: 3.1 - 3.25		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. Other Properties	(1951). Asbestos, a mineral of unparalle s	eled properties. Transac	tions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Value		Specific gravity: 3.2 - 3.3		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	Medium	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties					
HERO ID:	3827307					
	EXTRACTION					
Parameter		Data				
CASKN and Test Material	Zuidalina	//536-68-6; Iremolite				
Solvent Reactivity Storage	and Stability	ND. ND. ND. ND				
Radiolabel Source State a	and Purity	NR · NR · NR · NR				
Results Value	ind Fully	Essential composition: Ca. Mg silicate w	ith some water			
Results Details		Not Reported				
Results Remarks		Not Reported				
			EVALUATION			
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	y Determi	nation	Medium			

Study Citation: OECD Harmonized	Badollet, M. S. ( Other Properties	1951). Asbestos, a mineral of unparalle	led properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-68-6; Tremolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR		
Results Value		Luster: silky		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	itv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determin	nation	High	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties				
HERO ID:	3827307				
			EXTRACTION		
Parameter		Data			
CASRN and Test Material		77536-68-6; Tremolite			
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR			
Results Value		Mohs hardness: 5.5			
Results Details		Not Reported			
Results Remarks		Not Reported			
			Εναι ματιονι		
Domain		Matria	E VALUATION Dating	Commonte	
Domain 1. Substance		Metric	Katilig	Comments	
Domain 1: Substance	Matria 1.	Depresentativeness	Uich	Data are many and for the sphinat chamical sphere as	
	Metric 1:	Ammoniatorias	nigii N/A	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	IN/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.	
Domain 3: Other					
Domain J. Outer	Metric 5	Databases	N/A	Rating of this factor is not applicable to this kind of information	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Quality Determination			Medium	v 11	

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties						
HERO ID:	3827307						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		77536-68-6; Tremolite					
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR					
Results Value		Specific gravity: 2.9 - 3.2					
Results Details		Not Reported					
Results Remarks		Not Reported					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance			-				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome			
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Quality Determination</b>			Medium				

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties					
HERO ID:	3827307					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material	Tuidalina	//536-68-6; Tremolite				
Solvent Reactivity Storage	Juluellile	ND: ND: ND: ND				
Radiolabel Source State a	and Purity	NR · NR · NR · NR				
Results Value	and I unity	Optical properties: Biaxial negative extin	ction inclined			
Results Details		Not Reported				
Results Remarks		Not Reported				
			EVALUATION			
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabili	itv					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	ty Determi	nation	Medium			

Study Citation: OECD Harmonized	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties						
HERO ID:	3827307						
	EXTRACTION						
Parameter	meter Data						
CASRN and Test Material		77536-68-6; Tremolite					
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR					
Results Value		Tensile strength: 7 - 60 Mpa (1,000 - 8,00	0 lb./in.^2)				
Results Details		Not Reported					
Results Remarks		Not Reported					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabili	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	Matric 1:	(Method Objectivity) Reliability/Apolytical Method	Madium	The analytical method is unknown but is likely to be appropriate based on the date's			
	Meule 4.	Kenability/Anarytical Method	Weddulli	inclusion in a peer-reviewed/recognized database or other secondary source.			
Domain 3 <sup>.</sup> Other							
Domain 5. Outer	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information			
	Metric 6: Models N/A Rating of this factor is not applicable to this kind of information.			Rating of this factor is not applicable to this kind of information.			
Overall Qualit	y Determi	nation	Medium				

Study Citation:	Bartosiewicz, L. (1973). Improved Techniques of Identification and Determination of Airborne Asbestos. American Industrial Hygiene Association Journal				
OECD Harmonized	Other Properties				
Template:	· · · · · · · · · · · · · · · · ·				
HERO ID:	3099513				
EXTRACTION					
Parameter		Data			
CASRN and Test Material		1332-21-4; Asbestos			
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR			
Results Value		2-15 um size, 12.7% particles $\geq$ 5 µm, ave	erage particle size	2.9 μm	
Results Details		Not Reported			
Results Remarks		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-	
		(Method Objectivity)		tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is non-standard but is expected to be appropriate.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	ty Determina	ation	High		

Study Citation: OECD Harmonized	Hwang, C. Y. (1983). Size and shape of airborne asbestos fibres in mines and mills. British Journal of Industrial Medicine 40(3):273-279. Other Properties					
HERO ID:	3083760					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material	~	12001-29-5; Chrysotile				
Confidentiality, Type, and C	Juideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR				
Results Value		Fiber size, median true diameter: 0.06 µm				
Results Details		Not Reported				
Results Remarks		Not Reported				
		E	VALUATION	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	Overall Quality Determination High					

Study Citation: OECD Harmonized	Hwang, C. Y. (19 Other Properties	983). Size and shape of airborne asbestos fi	bres in mines	and mills. British Journal of Industrial Medicine 40(3):273-279.			
HERO ID:	3083760						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		12172-73-5; Amosite					
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR					
Results Value		Fiber size, median true diameter: 0.26 µm					
Results Details		Not Reported					
Results Remarks		Not Reported					
		E	VALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Qualit	Overall Quality Determination High						

Study Citation: OECD Harmonized	Hwang, C. Y. (1 Other Properties	983). Size and shape of airborne asbestos fil	ores in mines	and mills. British Journal of Industrial Medicine 40(3):273-279.	
HERO ID:	3083760				
EXTRACTION					
Parameter	Data				
CASRN and Test Material		12001-28-4; Crocidolite			
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR			
Results Value		Fiber size, median true diameter: 0.09 µm			
Results Details		Not Reported			
Results Remarks		Not Reported			
		<b>T</b>	VALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance			Tuning		
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	itv				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.	
Domain 21 Other					
Domain J. Outer	Metric 5 <sup>.</sup>	Databases	N/A	Rating of this factor is not applicable to this kind of information	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Quality Determination High				

Study Citation: OECD Harmonized	Hwang, C. Y. (1 Other Properties	983). Size and shape of airborne asbestos f	îbres in mines	and mills. British Journal of Industrial Medicine 40(3):273-279.		
HERO ID:	3083760					
	EXTRACTION					
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR				
Results Value		Fiber size, median true length: 0.55 µm				
Results Details		Not Reported				
Results Remarks		Not Reported				
<b>D</b>			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance	M ( 1		TT' 1			
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 2: Other						
Domain 5. Outer	Metric 5	Databases	N/A	Rating of this factor is not applicable to this kind of information		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
		_				
Overall Quality Determination						

Study Citation: OECD Harmonized	Hwang, C. Y. (1983). Size and shape of airborne asbestos fibres in mines and mills. British Journal of Industrial Medicine 40(3):273-279. Other Properties				
HERO ID:	3083760				
		]	EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12172-73-5; Amosite			
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR			
Results Value		Fiber size, median true length: 2.53 µm			
Results Details		Not Reported			
Results Remarks		Not Reported			
р. :			EVALUATIO	N Contraction of the second seco	
Domain		Metric	Rating	Comments	
Domain 1: Substance	34.1.1				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Quality Determination High				
# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

HERO ID: 3083760 Table: 6 of 6

Study Citation: OECD Harmonized	Hwang, C. Y. (1 Other Properties	983). Size and shape of airborne asbestos	fibres in mines	and mills. British Journal of Industrial Medicine 40(3):273-279.		
HERO ID:	3083760					
EXTRACTION						
Parameter		Data				
CASRN and Test Material		12001-28-4; Crocidolite				
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR				
Results Value		Fiber size, median true length: 1.16 µm				
Results Details		Not Reported				
Results Remarks		Not Reported				
			EVALUATION	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	Overall Quality Determination High					

Study Citation:	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and			
OECD Harmonized	Other Properties			
Template:	1			
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-68-6; tremolite		
Confidentiality, Type, and C	Guideline	none; not specified; None		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	None; NR; solid; NR		
Results Value		acid resistant		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	itv			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	3.5.1.4	(Method Objectivity)	27/4	towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	y Determin	ation	High	

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

HERO ID: 3970851 Table: 2 of 6

Study Citation:	IARC, (2012). Al anthophyllite).	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite)			
<b>OECD Harmonized</b>	Other Properties				
Template:	-				
HERO ID:	3970851				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		77536-66-4; actinolite			
Confidentiality, Type, and (	Guideline	none: not specified: None			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	None; NR; solid; NR			
Results Value		resistance to acids: none			
Results Details		Not Reported			
Results Remarks		Not Reported			
			FVAL HATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance		metric	Rung	connents	
2 oniani 11 Substance	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Tast Paliabil					
Domain 2. Test Kenaon	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	ty Determin	ation	High		

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

HERO ID: 3970851 Table: 3 of 6

Study Citation:	IARC, (2012). A	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and				
<b>OECD Harmonized</b>	Other Properties					
Template:						
HERO ID:	3970851					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material	<b>C</b>	7/536-67-5; anthophyllite				
Solvent Reactivity Storage	and Stability	ND. ND. ND. ND				
Radiolabel Source State a	and Purity	None: NR: solid: NR				
Results Value	and Fully	resistance to acids: very				
Results Details		Not Reported				
Results Remarks		Not Reported				
			<b>EVALUATIO</b>	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance		D	TT' 1			
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	Matria 4.	(Method Objectivity)	NT/A	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	IN/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	ty Determin	ation	High			

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

Study Citation:	IARC, (2012). AF	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and			
<b>OECD</b> Harmonized	Other Properties				
Template:	I I I I I I I I I I I I I I I I I I I				
HERO ID:	3970851				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12172-73-5: amosite			
Confidentiality, Type, and C	Guideline	none; not specified; None			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	None; NR; solid; NR			
Results Value		resistance to acids: somewhat			
Results Details		Not Reported			
Results Remarks		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome	
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	ty Determina	ation	High		

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

HERO ID: 3970851 Table: 5 of 6

Study Citation:	IARC, (2012). Al	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and				
<b>OECD Harmonized</b>	Other Properties					
Template:						
HERO ID:	3970851					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material	a	12001-28-4; crocidolite				
Confidentiality, Type, and C		none; not specified; None				
Badialabel Source State of	e, and Stability	NR; NR; NR; NR None: NP: solid: NP				
Results Value	and I unity	resistance to acids: good				
Results Details		Not Reported				
Results Remarks		Not Reported				
		, r				
			EVALUATIO	Ň		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	N	(Method Objectivity)	27/4	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	ty Determin	ation	High			

## PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

HERO ID: 3970851 Table: 6 of 6

Study Citation:	IARC, (2012). Al	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and				
OECD Harmonized	Other Properties					
Template:						
HERO ID:	3970851					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		12001-29-5; chrysotile				
Confidentiality, Type, and C	Guideline	none; not specified; None				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	None; NR; solid; NR				
Results Value		Fibers degrade in dilute acids				
Results Details		Not Reported				
Results Remarks		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	Overall Quality Determination High					

Study Citation:	Lahondère, D., Cagnard, F., Wille, G., Duron, J., Misseri, M. (2018). TEM and FESEM characterization of asbestiform and non-asbestiform actinolite							
OECD Harmonized	Other Properties							
Template:								
HERO ID:	6865913							
	EXTRACTION							
Parameter		Data						
CASRN and Test Material		12172-67-7; Actinolite						
Confidentiality, Type, and C	Juideline	None; Experimental; Diameter and aspe	ect ratio; NA					
Solvent, Reactivity, Storage	, and Stability	NA; NR; NR; NR						
Radiolabel, Source, State, a	nd Purity	NA; Saint-Salvi de Carcaves Unit and F	rehel Unit in France	; Solid; NR				
Results Value		Aspect ratio: $20:1 - 100:1$ , width $< 0.5$	μm					
Results Details		Analytical method: SEM-EDS-TEM-EI	DS					
Results Remarks		Not Reported						
			EVALUATION	л				
Domain		Metric	Rating	Comments				
Domain 1: Substance								
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.				
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.				
Domain 2: Test Reliabili	tv							
2011411 21 1000 1101401	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased				
		(Method Objectivity)		towards a particular product or outcome.				
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.				
Domain 3: Other								
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.				
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.				
<b>Overall Qualit</b>	y Determi	nation	High					

Study Citation:	(2017). PubChe	(2017). PubChem: Chrysotile.					
<b>OECD Harmonized</b>	Other Properties	5					
Template:							
HERO ID:	3860485						
			EXTRACTION				
Parameter		Data					
CASRN and Test Materia	1	12001-29-5; Not Reported					
Confidentiality, Type, and	Guideline	Not Reported; Not Reported; Not Reported					
Solvent, Reactivity, Storag	Solvent, Reactivity, Storage, and Stability		Not Reported; Not Reported; Not Reported; Not Reported				
Radiolabel, Source, State,	and Purity	Not Reported; Not Reported; Not Reported; Not Reported					
Results Value		Almost completely destroyed within 1 hour in 1N HCl					
Results Details		at 95C					
Results Remarks		Asbestos minerals, despite a relatively high fusion temperature, are completely decomposed at temperatures of 1,000 deg C.					
			EVALUATION				
Domain		Metric	Pating	Comments			

Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features (e.g., presence of certain functional groups) or other physical/chemical properties (e.g.,
				if the physical state is described as a liquid, the substance should have a melting point below 25°C and a boiling point above 25°C) or behaviors.
Domain 2: Test Reliab	oility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

\* Related References: Source: USEPA; Ambient Water Quality Criteria Doc: Asbestos p.A-3 (1980) EPA 440/5-80-022 (not a primary source; Primary source found in document: Lindell. 1972 Biological effects of asbestos.)

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

Study Citation: OECD Harmonized	(2017). PubChem: Other Properties	(2017). PubChem: Chrysotile. Other Properties				
Template:						
HERO ID:	3860485					
EXTRACTION						
Parameter		Data				
CASRN and Test Material		12001-29-5; Not Reported				
Confidentiality, Type, and C	Guideline	Not Reported; Not Reported; Not Repor	ted			
Solvent, Reactivity, Storage	e, and Stability	Not Reported; Not Reported; Not Repor	ted; Not Reported			
Radiolabel, Source, State, a	and Purity	Not Reported; Not Reported; Not Repor	ted; Not Reported			
Results Value		Thermal decomposition is accomplished	through dehydroxy	lation and dehydration mechanisms. Under dynamic heating conditions, dehydroxyla-		
Results Details		Not Reported	or fastering and since	a is apparent at 81 deg C.		
Results Remarks		Not Reported				
			EVALUATION	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features		
				(e.g., presence of certain functional groups) or other physical/chemical properties (e.g.,		
				below 25°C and a boiling point above 25°C) or behaviors.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
	Metric 4.	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was		
	Methe 1.	Renability/ mary tear Wealoa	Low	used.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are		
				use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Owenell Orali	Dotomo:	tion	II:ab			
Overall Quality	ly Determina		nign			

\* Related References: Source: USEPA, Office of Drinking Water; Criteria Document (Draft): Asbestos p./1-8 (1980) (not a primary source)

### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

Study Citation:	(2017). PubChem:	Chrysotile.					
OECD Harmonized	Other Properties						
Template:							
HERO ID:	3860485						
			EXTRACTION				
Parameter		Data					
CASRN and Test Material		12001-29-5; Not Reported					
Confidentiality, Type, and	Guideline	Not Reported; Not Reported; Not Reported					
Solvent, Reactivity, Storage	e, and Stability	Not Reported; Not Reported; Not Reported; Not Reported					
Radiolabel, Source, State,	and Purity	Not Reported; Not Reported	; Not Reported; Not Reported				
Results Value		Completely decomposed in a	concentrated Potassium hydroxide.				
Results Details		at 200C					
Results Remarks The resistance of the deterioration observed.			the resistance of the asbestos fibers to attack by reagents other than acid as excellent up to temperatures of approximately 100 deg C with rapid sterioration observed at higher temperatures.				
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							

Domain		Wieurc	Kating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features (e.g., presence of certain functional groups) or other physical/chemical properties (e.g., if the physical state is described as a liquid, the substance should have a melting point below 25°C and a boiling point above 25°C) or behaviors.
Domain 2: Test Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

\* Related References: Source: USEPA; Ambient Water Quality Criteria Doc: Asbestos p.A-5 (1980) EPA 440/5-80-022 (not a primary source; Primary source found in document)

Study Citation:	Seshan, K. (1983). How are the physical and chemical properties of chrysotile asbestos altered by a 10-year residence in water and up to 5 days in simulated stomach acid? Environmental Health Perspectives 53(NOV):143-148				
<b>OECD Harmonized</b>	Other Properties				
Template:	•				
HERO ID:	3582855				
	EXTRACTION				
Parameter	Data				
CASRN and Test Material	12001-29-5; Chrysotile asbestos				
Confidentiality, Type, and C	Guideline None; Experimental; Not Reported				
Solvent, Reactivity, Storage	e, and Stability NR; NR; NR				
Radiolabel, Source, State, a	and Purity No; International Union Against Cancer (UICC); National Institute of Environmental Health Sciences (NIEHS); Globe, AZ.; NR; NR				
Results Value	Zeta potential changed from positive to negative in $<1$ hr after exposure to simulated gastric juice. Zero point charge moved from pH 6.5 for untreated fibers to pH 4 in 0.1N HCl treated for 5 days.				
Results Details	Not Reported				
Results Remarks	Not Reported				

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
		(Method Objectivity)		tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is non-standard but is expected to be appropriate.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

Study Citation:	Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research				
<b>OECD Harmonized</b>	Other Properties				
Template:	1				
HERO ID:	3581901				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material		12172-73-5; Amosite			
Confidentiality, Type, and C	Buideline	None; Experimental; NA; mean diameter			
Solvent, Reactivity, Storage	, and Stability	NA; NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	NA; South Africa; Solid; NR Notes: Air j	jet milled		
Results Value		Mean log width= $-0.339 \pm 0.229$ um (width= $1.536 \pm 0.523$	$dth = 0.458 \pm 1.69$	0 um), log length = 1.197 $\pm$ 0.592 (length = 15.7 $\pm$ 3.91 um), mean log aspect ratio =	
Results Details		Measured by SEM			
Results Remarks		Not Reported			
			EVALUATION	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Tast Paliabili	<b>f</b> x7				
Domain 2. Test Kenabin	Matria 2:	Paliability/Unbiased	Uich	The methodology for mechanics the information is designed to an average a specific average	
	Meure 5.	(Mathad Objectivity)	High	tion and the methodology's objective is clear	
	Metric 4.	Reliability/Analytical Method	High	The analytical methods are appropriate	
	ineure i.		Ingn		
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	y Determina	ation	High		

Study Citation:	Siegrist, H. G., Wy	Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research				
<b>OECD Harmonized</b>	23(2):348-361. Other Properties					
Template:						
HERO ID:	3581901					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		12001-28-4: Crocidolite				
Confidentiality, Type, and C	Guideline	None; Experimental; None; mean diame	ter			
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NA; South Africa; Solid; NR Notes: Air	jet milled			
Results Value		Mean log width= -0.606 $\pm$ 0.203 um (w	width = $0.248 \pm 1.6$	0 um), mean log length = 0.727 $\pm$ 0.442 (length = 5.33 $\pm$ 2.77 um), mean log aspect		
Posulta Dataila		ratio = $1.332 \pm 0.426$				
Results Remarks		Not Reported				
Results Remarks		Not Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
		(Method Objectivity)		tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	The analytical methods are appropriate.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	ty Determina	ation	High			

Study Citation:	Siegrist, H. G., Wy	Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research					
OECD Harmonized	Other Properties						
Template:							
HERO ID:	3581901						
		E	XTRACTIO	N			
Parameter		Data					
CASRN and Test Material		12001-29-5; Chrysotile					
Confidentiality, Type, and C	Buideline	None; Experimental; None; mean diameter					
Solvent, Reactivity, Storage	, and Stability	NA; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NA; Idria, California; Solid; NR Notes: Shor	t-fiber. Air cla	ssified.			
Results Value		Mean log width= $-0.780 \pm 0.255$ um (width $0.002 \pm 0.561$ (length = $1.00 \pm 3.64$ um) by	$= 0.166 \pm 1.8$ y SEM, mean b	0 um) by SEM, $-1.234 \pm 0.251$ um (width = $0.058 \pm 1.78$ um) by TEM, log length = og length = $0.710 \pm 0.338$ (length = $5.13 \pm 2.18$ um) by TEM; mean log aspect ratio			
		$1.590 \pm 0.383$ um by SEM and $1.236 \pm 0.45$	0 um by TEM				
Results Details		Measured by SEM and TEM					
Results Remarks		Not Reported					
<b>D</b> .		E	VALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance	36.1.1						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliabili	ity						
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-			
		(Method Objectivity)		tion, and the methodology's objective is clear.			
	Metric 4:	Reliability/Analytical Method	High	The analytical methods are appropriate.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	y Determina	ition	High				

Study Citation:	Siegrist, H. G., Wy	Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research				
OECD Harmonized	23(2):348-361. Other Properties					
Template:	· · · · · · · · · · · · · · · · · · ·					
HERO ID:	3581901					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and C	Guideline	None; Experimental; NA; mean diamete	r			
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NA; Thetford, Quebec; Solid; NR Notes	: Long-fiber. Air cl	assified.		
Results Value		Mean log width= -0.870 $\pm$ 0.255 um (w	width = $0.135 \pm 1.8$	0 um), mean log length = 0.651 $\pm$ 0.619 (length = 4.48 $\pm$ 4.16 um), mean log aspect		
Paculte Dataile		ratio = $1.580 \pm 0.383$ Measured by SEM				
Results Remarks		Not Reported				
Results Remarks		not repond				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
		(Method Objectivity)		tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	The analytical methods are appropriate.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	ty Determina	ation	High			

Study Citation:	Siegrist, H. G., Wy	Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research				
OECD Harmonized	Other Properties					
Template:	3581001					
IIERO ID:	5561901					
<b>D</b> (		D (	EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		14567-73-8; Tremolite				
Confidentiality, Type, and C	Guideline	None; Experimental; NA; mean diameter				
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, a	and Purity	NA; St. Lawrence County, NY; Solid; NR	ł			
Results Value Mean log width = $0.117 \pm 0.292$ um (width = $1.31 \pm 1.95$ um), mean log length = $0.464 \pm 0.344$ (length = $2.91 \pm 2.20$ ), mean log aspect ratio				um), mean log length = $0.464 \pm 0.344$ (length = $2.91 \pm 2.20$ ), mean log aspect ratio =		
Results Details		$0.347 \pm 0.214$ Measured by SEM and TEM				
Results Remarks		Not Reported				
Results Remarks		Tor Reported				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
	34.1.4	(Method Objectivity)	TT: 1	tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	The analytical methods are appropriate.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Qualit</b>	ty Determina	ntion	High			

Study Citation:	Snyder, J. G., Virta, R. L., Segreti, J. M. (1987). Evaluation of the phase contrast microscopy method for the detection of fibrous and other elongated				
OECD Harmonized	Mineral particulates by comparison with a STEM technique. American Industrial Hygiene Association Journal 48(5):4/1-477. Other Properties				
Template:	3615022				
	3013922				
		EXTRACTION			
Parameter		Data			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and	Guideline	None; Experimental; None; mean length and diameter			
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NA; Personal air-monitor filters from workers involved in construction, fiber packing, cutting sheet asbestos, and crushed stone operation, operation			
		mill, and open pit mine; Solid; 100% chrysotile Notes: Samples prepared according to the USPHS/NIOSH filter membrane method for evaluating			
D14- V-1		airborne asbestos fibers Mana las lanata - 0.021 - 0.507 um Mana las mitta - 0.620 - 1.120 um Mana las arrestantias - 0.042 - 1.272 Mana las districtional de la companya de			
Results Value		Mean log length = $0.031 - 0.037$ µm; Mean log width = $-0.0501.120$ µm; Mean log aspect ratio = $0.942 - 1.2/3$ ; Mean length = $1.07 - 3.95$ µm; Mean width = $0.234 - 0.076$ µm; Mean aspect ratio = $8.75 - 18.7$			
Results Details		Measured by STEM with EDXA on a particle-by-particle basis			
Results Remarks		Ranges of averages of 8 samples from different occupational or mining settings. Log values were converted by reviewer.			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

Study Citation:	Snyder, J. G., Virta, R. L., Segreti, J. M. (1987). Evaluation of the phase contrast microscopy method for the detection of fibrous and other elongated mineral particulates by comparison with a STEM technique. American Industrial Hygiene Association Journal 48(5):471-477					
<b>OECD Harmonized</b>	Other Properties	-)				
Template:						
HERO ID:	3615922					
		EXTRACTION				
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and G	Juideline	None; Experimental; None; mean length and diameter				
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, and Purity		NA; Personal air-monitor filters from workers involved in mixing fiber for cement; Solid; 92% chrysotile, 8% tremolite Notes: Samples prepared according to the USPHS/NIOSH filter membrane method for evaluating airborne asbestos fibers				
Results Value		Mean log length = $0.380 \ \mu m$ ; Mean log width = $-0.619 \ \mu m$ ; Mean log aspect ratio = $0.999$ ; Mean length = $2.40 \ \mu m$ ; Mean width = $0.240 \ \mu m$ ; Mean aspect ratio = $9.98$				
Results Details		Measured by STEM with EDXA on a particle-by-particle basis				
Results Remarks		Sample from occupational setting. Log values were converted by reviewer.				

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determi	nation	High	

Study Citation:	Snyder, J. G., Virta	a, R. L., Segreti, J. M. (1987). Evaluation of the phase contrast microscopy method for the detection of fibrous and other elongated		
<b>OECD Harmonized</b>	Other Properties			
Template:				
HERO ID:	3615922			
		EXTRACTION		
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and G	Juideline	None; Experimental; None; mean length and diameter		
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR		
Radiolabel, Source, State, and	nd Purity	NA; Personal air-monitor filters from workers involved in vacuuming after asbestos removal; Solid; 40% amosite, 35% chrysotile, 5% gypsum,		
		20% other Notes: Samples prepared according to the USPHS/NIOSH filter membrane method for evaluating airborne asbestos fibers		
Results Value		Mean log length = 0.610 and 0.715 $\mu$ m; Mean log width = -0.654 and -0.638 $\mu$ m; Mean log aspect ratio = 1.264 and 1.353; Mean length = 4.07		
Results Details		and 5.19 um; Mean Width = 0.222 and 0.230 um; Mean aspect ratio = 18.4 and 22.5 Measured by STEM with EDXA on a particle-by-particle basis		
Results Remarks		2 samples from occupational settings. Log values were converted by reviewer.		

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	lity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

Study Citation:	Snyder, J. G., Virta	a, R. L., Segreti, J. M. (1987). Evaluation of the phase contrast microscopy method for the detection of fibrous and other elongated s by comparison with a STEM technique. American Industrial Hygiene Association Journal 48(5):471-477.			
<b>OECD Harmonized</b>	Other Properties				
Template:					
HERO ID:	3615922				
		EXTRACTION			
Parameter		Data			
CASRN and Test Material		12172-73-5; Amosite			
Confidentiality, Type, and G	luideline	None; Experimental; None; mean length and diameter			
Solvent, Reactivity, Storage,	, and Stability	NA; NR; NR; NR			
Radiolabel, Source, State, and	nd Purity	NA; Personal air-monitor filters from workers involved in insulation removal from ducting; Solid; 35% amosite, 50% chrysotile, 15% other Notes:			
		Samples prepared according to the USPHS/NIOSH filter membrane method for evaluating airborne asbestos fibers			
Results Value		Mean log length = 0.666 $\mu$ m; Mean log width = -0.588 $\mu$ m; Mean log aspect ratio = 1.255; Mean length = 4.63 $\mu$ m; Mean width = 0.258 $\mu$ m; Mean aspect ratio = 17.00			
Results Details		Measured by STEM with EDXA on a particle-by-particle basis			
Results Remarks		Sample from occupational setting. Log values were converted by reviewer.			

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
		(Method Objectivity)		tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

Study Citation:	Snyder, J. G., Virta mineral particulate	a, R. L., Segreti, J. M. (1987). Evaluation of the phase contrast microscopy method for the detection of fibrous and other elongated s by comparison with a STEM technique. American Industrial Hygiene Association Journal 48(5):471-477.		
<b>OECD Harmonized</b>	Other Properties			
Template:				
HERO ID:	3615922			
		EXTRACTION		
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and G	Guideline	None; Experimental; None; mean length and diameter		
Solvent, Reactivity, Storage,	, and Stability	NA; NR; NR; NR		
Radiolabel, Source, State, and Purity		NA; Personal air-monitor filters from workers involved in insulation removal from ducting; Solid; 60% amosite, 20% chrysotile, 4% gypsum, 16% other Notes: Samples prepared according to the USPHS/NIOSH filter membrane method for evaluating airborne asbestos fibers		
Results Value		Mean log length = $0.647 \mu$ m; Mean log width = $-0.595 \mu$ m; Mean log aspect ratio = $1.242$ ; Mean length = $4.44 \mu$ m; Mean width = $0.254 \mu$ m; Mean aspect ratio = $17.46$		
Results Details		Measured by STEM with EDXA on a particle-by-particle basis		
Results Remarks		Sample from occupational setting. Log values were converted by reviewer.		

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

Study Citation:	Snyder, J. G., Virta	Snyder, J. G., Virta, R. L., Segreti, J. M. (1987). Evaluation of the phase contrast microscopy method for the detection of fibrous and other elongated					
<b>OECD Harmonized</b>	Other Properties	by comparison with a STEW technique. American industrial Hygiche Association Journal 40(5).471-477.					
Template:	-						
HERO ID:	3615922						
		EXTRACTION					
Parameter		Data					
CASRN and Test Material		13768-00-8; Actinolite					
Confidentiality, Type, and G	Juideline	None; Experimental; None; mean length and diameter					
Solvent, Reactivity, Storage	, and Stability	NA; NR; NR; NR					
Radiolabel, Source, State, and Purity		NA; Personal air-monitor filters from workers involved in crushed stone operation; Solid; 100% actinolite Notes: Samples prepared according to the USPHS/NIOSH filter membrane method for evaluating airborne asbestos fibers					
Results Value		Mean log length = 0.339 and 0.214 $\mu$ m; Mean log width = -0.355 and -0.476 $\mu$ m; Mean log aspect ratio = 0.695 and 0.690; Mean length = 2.18 and 1.64 $\mu$ m; Mean width = 0.442 and 0.334 $\mu$ m; Mean aspect ratio = 4.95 and 4.90					
Results Details		Measured by STEM with EDXA on a particle-by-particle basis					
Results Remarks		2 samples from manufacturing settings. Log values were converted by reviewer.					

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabi	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Quality Determination</b>			High	

Study Citation:	Thorne, P. S., Lig	Thorne, P. S., Lightfoot, E. N., Albrecht, R. M. (1985). Physicochemical characterization of cryogenically ground, size separated, fibrogenic particles.					
OECD Harmonized	Other Properties	search 36(1):89-110.					
Template:	2615790						
HERO ID:	3013789						
		EXTRACTION					
Parameter		Data					
CASRN and Test Material		12001-29-5; Chrysotile					
Confidentiality, Type, and C	Buideline	None; Experimental; Not Reported					
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	No; Union Carbide Corp, CA; Monoclinic crystal; NR					
Results Value		Chemical composition (ppm): 2467 Al; 678 Mn; 13.7 V; 1.1 Br; 88.4 Co; 1400 Cr; 9.69 Cs; 15380 Fe; 404 Na; 1914 Ni; 6.4 Sc; 1.20 W; 0.539 As; 3.4 He; 0.0176 Sm; 110 Zn					
Results Details		Average particle size (n=50) measured by SEM: 1.00 +/- 0.44 um for Largest dimension, and 0.07 +/- 0.02 um for Smallest dimension.					
Results Remarks		Not Reported					

EVALUATION					
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliab	bility				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	

Study Citation:	U.S. EPA, (2014). (IRIS).	Toxicological review of libby amph	ibole asbestos: I	n support of summary information on the Integrated Risk Information System
<b>OECD Harmonized</b>	Other Properties			
Template:				
HERO ID:	3827272			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12425-92-2; winchite		
Confidentiality, Type, and G		none; not specified; not specified		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, an	nd Purity	NR; NR; NR; NR Notes: NR		
Results Value		Optical property: pleochroism	1.11 1.1.7	1.1.11
Results Details		weak to moderate: $X = colorless$ , $Y = lig$	ght blue-violet, Z =	iight blue
Results Remarks		Not Reported		
			EVALUATION	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabili	ty			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determina	ation	High	

\* Related References: www.minsocam.oeg/msa/Handbook/Winchite.PDF.

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

Study Citation:	U.S. EPA, (2014).	Toxicological review of libby amphi	oxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System				
OECD Harmonized	Other Properties						
HERO ID:	3827272						
			EXTRACTIO	Ň			
Parameter		Data					
CASRN and Test Material		17068-76-7; richterite					
Confidentiality, Type, and C	Guideline	none; not specified; not specified					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR					
Results Value		Optical property: pleochroism					
Results Details		weak to strong in pale yellow, orange, and	d red				
Results Remarks		Not Reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Qualit</b>	ty Determina	ation	High				

\* Related References: www.minsocam.oeg/msa/Handbook/Winchite.PDF.

\_

\_\_\_\_

Study Citation:	Vaillancourt, A upon leaching of	., Denes, G., Le Van Mao, R. (1997). Rea of magnesium. Materials Research Societ	ctivity of chrysot ty Symposium Pr	ile asbestos in acids: Mechanism of transformation to silicon dioxide hemihydrate oceedings, vol. 453 :71-76.
OECD Harmonized	Other Propertie	s		
Template:	(072050			
HERO ID:	68/3950			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5: Chrysotile		
Confidentiality, Type, and	Guideline	None: Experimental: None: Average fib	er diameter	
Solvent, Reactivity, Storag	e. and Stability	NR: NR: NR		
Radiolabel, Source, State,	and Purity	NA; Mined in Asbestos, Quebec; Solid;	Commercial grade	Notes: batch 7TF12
Results Value	2	Average fiber diameter: 156 angstroms	e	
Results Details		NA		
Results Remarks		NA		
				AT
Domain		Metric	EVALUATIO	Comments
Domain 1: Substance		Wietric	Katilig	Comments
Domain 1. Substance	Metric 1	Representativeness	High	Data are measured for the subject chemical substance
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quali	ty Determi	nation	High	Rating of this factor is not applicable to this kind of information.

Study Citation:	tudy Citation: Vaillancourt, A., Denes, G., Le Van Mao, R. (1997). Reactivity of chrysotile asbestos in acids: Mechanism of transformation to silicon dioxide hemihydrate upon leaching of magnesium. Materials Research Society Symposium Proceedings, vol. 453:71-76				
OECD Harmonized	Other Properties				
Tomplata:	Suler rioperties				
	(972050				
HEKU ID:	08/3930				
		EXTRACTION			
Parameter		Data			
CASRN and Test Material		12001-29-5; Chrysotile			
Confidentiality, Type, and Guideline		None; Experimental; Not reported; resistance to acids			
Solvent, Reactivity, Storage, and Stability		NR; NR; NR			
Radiolabel, Source, State, an	nd Purity	NA; Mined in Asbestos, Quebec; Solid; Commercial grade Notes: batch 7TF12			
Results Value		Up to 1 N HCl or H2SO4, degree of crystallinity (DC) increases to 115% due to the dissolution of brucite and pyroaurite impurities (lower sample mass and therefore higher apparent DC). Above 1 N, leaching becomes significant, and DC decreases to zero at ~7N			
Results Details		Minor smooth changes from acetic acid (ACA) and oxalic acid (OXA) with secondary leaching			
Results Remarks		Acid leaching of chrysotile first rapidly dissolves the basic impurities, brucite and pyroaurite; then the outer layers have "Brucite-type magnesium" removed preferentially (no major structural reorganization); then "skeletal magnesium" is removed (structural collapse and amorphous silicon dioxide hemihydrate is formed).			

EVALUATION						
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.		
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.		
Domain 2: Test Reliabil	ity					
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>			High			

HERO ID: 3827175 Table: 1 of 3

Study Citation:	Virta, R. L. (201	1). Asbestos. :1-40.		
OECD Harmonized	Other Properties	3		
Template:				
HERO ID:	3827175			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR		
Results Value		Zeta potential: -32 mV		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabil	ity			
2 sinuin 2. Test Rendon	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's
				inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	tv Determi	nation	Medium	
			munum	

HERO ID: 3827175 Table: 2 of 3

Study Citation: OECD Harmonized	Virta, R. L. (201 Other Properties	1). Asbestos. :1-40.		
Template:	1			
HERO ID:	3827175			
			EXTRACTION	
Parameter		Data		
CASRN and Test Material	~	12001-29-5; Chrysotile		
Confidentiality, Type, and C	Juideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	ind Purity	NR; NR; NR; NR		
Results Value		Zeta potential: +15.0 to +54 mV		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliabili	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	y Determi	nation	Medium	

HERO ID: 3827175 Table: 3 of 3

Study Citation:	Virta, R. L. (201	1). Asbestos. :1-40.		
OECD Harmonized	Other Properties			
Template:	2027175			
	302/1/3			
D		Dete	EXTRACTION	
Parameter		Data		
CASRN and Test Material	~	12172-73-5; Amosite		
Confidentiality, Type, and C	Juideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: CAS in paper	r: Amosite [19172-73-5]	
Results Value		Zeta potential: -20 to -40 mV		
Results Details		Not Reported		
Results Remarks		Not Reported		
Demain		Matria	EVALUATION	Commente
Domain Domain 1, Substance		Metric	Kating	Comments
Domain 1: Substance	Matria 1	<b>D</b> oprocontativonoss	High	Data are many and for the subject chamical substance
	Metric 1.	Appropriatoposs	nigii N/A	Data are measured for the subject chemical substance.
	Meuric 2.	Appropriateness	IN/A	Rating of this factor is not applicable to this kind of mformation.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Medium	The analytical method is unknown but is likely to be appropriate based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
			N / 1 ·	
<b>Overall Qualit</b>	ty Determin	nation	Medium	

HERO ID: 3859385 Table: 1 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004). Other Properties	. Asbestos. 3:288-319.		
Template:	ould rioperties			
HERO ID:	3859385			
			EXTRACTIO	Ň
Parameter		Data		
CASRN and Test Material		12001-28-4; crocidolite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		optical properties: biaxial negative oblig	ue extinction	
Results Details		not reported		
Results Remarks		not reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
20mm 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determina	ation	High	

HERO ID: 3859385 Table: 2 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004) Other Properties	). Asbestos. 3:288-319.			
Template: HERO ID:	3859385				
			EXTRACTIO	N	
Parameter		Data			
CACDN d T M-41		12001 28 4			
CASKN and Test Material	Guideline	12001-28-4; crocidolite			
Solvent Reactivity Storage	and Stability	NR · NR · NR · NR			
Radiolabel Source State a	and Purity	NR: NR: NR: NR Notes: NR			
Results Value	and Fully	zeta potential: -32 (surface charge, mV):	resistance to acids	: good: resistance to alkalies: good	
Results Details		not reported			
Results Remarks		not reported			
		•			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabil	ity				
2 0	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.	
Domain 3: Other					
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Quality Determination High				

HERO ID: 3859385 Table: 3 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004). Other Properties	Asbestos. 3:288-319.		
Template: HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		14567-73-8; tremolite		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		1 142
Results Value		tensile strength: <500 MPa (to convert I	MPa to psi, multiply	y by 145)
Results Details		not reported		
Results Remarks		not reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	itv			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Bomain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination High				

HERO ID: 3859385 Table: 4 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004) Other Properties	). Asbestos. 3:288-319.		
Template:				
HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
CASKN and Test Material	Guidalina	12001-28-4; crocidolite		
Solvent Resetivity Stores	Juidelille	ND, ND, ND, ND		
Radiolabel Source State	and Purity	NR: NR: NR: NR Notes: NR		
Results Value	and I unity	hardness = $4.0$ Mohs		
Results Details		not reported		
Results Remarks		not reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Somuli S. Oulo	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determin	ation	High	

HERO ID: 3859385 Table: 5 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004). Other Properties	. Asbestos. 3:288-319.		
Template: HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material	~	14567-73-8; tremolite		
Confidentiality, Type, and C	Juideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	ind Purity	NR; NR; NR; NR Notes: NR	Ilalian and	
Results Value		resistance to actus: good; resistance to a	ikanes: good	
Results Details		not reported		
Results Remarks		liot reported		
			EVALUATIO	
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
2 0	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
<b>Overall Qualit</b>	ty Determina	ation	High	
HERO ID: 3859385 Table: 6 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004 Other Properties	+). Asbestos. 3:288-319.						
Template:								
HERO ID:	3859385							
	EXTRACTION							
Parameter		Data						
CASRN and Test Material		12172-73-5; amosite						
Confidentiality, Type, and C	Guideline	none; not specified; not specified						
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR						
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR						
Results Value		tensile strength: 1500-2600 MPa (to cor	wert MPa to psi, mu	altiply by 145)				
Results Details		not reported						
Results Remarks		not reported						
			EVALUATIO	N				
Domain		Metric	Rating	Comments				
Domain 1: Substance								
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.				
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.				
Domain 2: Test Reliabil	ity							
2	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased				
		(Method Objectivity)		towards a particular product or outcome.				
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.				
Domain 3: Other								
Soman 5. Ouer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.				
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.				
<b>Overall Qualit</b>	Overall Quality Determination High							

HERO ID: 3859385 Table: 7 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004 Other Properties	). Asbestos. 3:288-319.					
Template: HERO ID:	3859385						
	EXTRACTION						
Parameter		Data					
CACDN d Tract Material		12001 20 4					
Confidentiality Type and (	Guideline	none: not specified: not specified					
Solvent Reactivity Storage	and Stability	NR · NR · NR · NR					
Radiolabel Source State a	and Purity	NR: NR: NR: NR Notes: NR					
Results Value	and I drity	tensile strength: 1400-4600 MPa (to cot	wert MPa to psi, mi	ltiply by 145)			
Results Details		not reported	i con con a co pos, inc				
Results Remarks		not reported					
		1					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Qualit	Overall Quality Determination High						

HERO ID: 3859385 Table: 8 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004) Other Properties	. Asbestos. 3:288-319.					
Template: HERO ID:	3859385						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		14567-73-8; tremolite					
Confidentiality, Type, and C	Guideline	none; not specified; not specified					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR	us systimation				
Results Value		optical properties: blaxial negative obliq	ue extinction				
Results Details		not reported					
Results Remarks		not reported					
			EVALUATIO				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Quality Determination High							

HERO ID: 3859385 Table: 9 of 16

Study Citation: OECD Harmonized	Virta, R. L. (200 Other Properties	4). Asbestos. 3:288-319.			
Template:	2950295				
	3839383				
Paramatar		Data	EXTRACTIO	N	
		Data			
CASRN and Test Material		14567-73-8; tremolite			
Confidentiality, Type, and	Guideline	none; not specified; not specified			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR			
Results Value		hardness = $5.5$ Mohs			
Results Details		not reported			
Results Remarks		not reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance	N . · · 1		TT' 1		
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.	
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.	
Domain 3: Other	Domain 2: Other				
Somuli S. Oulo	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	ty Determin	nation	High		

HERO ID: 3859385 Table: 10 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004 Other Properties	). Asbestos. 3:288-319.					
Template: HERO ID:	3859385						
	EXTRACTION						
Parameter		Data					
CASKN and Test Material	Zuidalina	12001-29-5; chrysotile	12001-29-5; chrysotile				
Solvent Beastivity Stores	and Stability	ND, ND, ND, ND					
Radiolabel Source State a	and Purity	NR: NR: NR: NR Notes: NR					
Results Value	und Furity	tensile strength: 1100-4400 MPa (to con	vert MPa to psi_mi	ultiply by 145)			
Results Details		not reported	vent nin u to poi, int				
Results Remarks		not reported					
			EVALUATIO				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabil	ity						
Domain 2. Test Rendom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 2: Other							
Somen S. Ouer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Quality Determination High							

HERO ID: 3859385 Table: 11 of 16

Study Citation: OECD Harmonized	Virta, R. L. (200 Other Properties	4). Asbestos. 3:288-319.		
Template:	-			
HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12172-73-5: amosite		
Confidentiality, Type, and (	Guideline	none: not specified: not specified		
Solvent. Reactivity. Storage	e. and Stability	NR: NR: NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value	-	hardness = $5.5-6.0$ Mohs		
Results Details		not reported		
Results Remarks		not reported		
				A.
Domain		Matria	EVALUATIO.	N Commonts
Domain Domain 1: Substance		Metric	Kating	Comments
Domain 1. Substance	Metric 1.	Representativeness	High	Data are measured or estimated for the subject chemical substance
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
		- FF - F	8	
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome.
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	nation	High	

HERO ID: 3859385 Table: 12 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004). Other Properties	. Asbestos. 3:288-319.				
Template: HERO ID:	3859385					
			EXTRACTIO	Ň		
Parameter		Data				
CASRN and Test Material		12172-73-5; amosite				
Confidentiality, Type, and C		none; not specified; not specified				
Badialabal Source State	e, and Stability	NK; NK; NK; NK ND: ND: ND: ND Notes: ND				
Rauloiabel, Source, State, a	and Fullty	optical properties: biaxial positive parall	al avtinction			
Results Details		not reported	er extiliction			
Results Remarks		not reported				
		lier reperied				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabil	ity					
2 0000000	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)	Ŧ	towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.		
Domain 3: Other						
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
<b>Overall Quality Determination</b>						

HERO ID: 3859385 Table: 13 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004 Other Properties	). Asbestos. 3:288-319.		
Template: HERO ID:	3859385			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and C	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		hardness = $2.5-4.0$ Mohs		
Results Details		not reported		
Results Remarks		not reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	ity			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Qualit	ty Determin	ation	High	

HERO ID: 3859385 Table: 14 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004). Other Properties	. Asbestos. 3:288-319.				
Template: HERO ID:	3859385					
	EXTRACTION					
Parameter		Data				
		12001 20 5. shows still				
Caskin and Test Material	Juidalina	12001-29-3; chrysolile				
Solvent Reactivity Storage	and Stability	ND · ND · ND · ND				
Radiolabel Source State a	and Purity	NR: NR: NR: NR Notes: NR				
Results Value	and Fullity	ontical properties: biaxial positive-parall	el extinction			
Results Details		not reported	er extinction			
Results Remarks		not reported				
		1				
			EVALUATIO	N		
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.		
Domain 2: Test Reliabil	ity					
2 chian 2. Test Rendon	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.		
Domain 3: Other						
Somen S. Ouer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Quality Determination High						

HERO ID: 3859385 Table: 15 of 16

Study Citation: OECD Harmonized	Virta, R. L. (2004) Other Properties	Asbestos. 3:288-319.					
Template: HERO ID:	3859385						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		12172-73-5; amosite					
Confidentiality, Type, and C	Guideline	none; not specified; not specified					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	nd Purity	NR; NR; NR; NR Notes: NR					
Results Value		zeta potential: -20 to -40 (surface charge	, mV); resistance to	acids: fair, slowly attacked; resistance to alkalies: good			
Results Details		not reported					
Results Remarks		not reported					
				AT			
Demain		Matria	EVALUATION Detine	Commenter.			
Domain		Metric	Rating	Comments			
Domain 1: Substance	M-4	Democratic	II: -l-				
	Metric 1:		High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabili	itv						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 5. Outer	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are			
		2 autoroto	mgn	peer-reviewed by experts in the field, are broadly available to the public for review and use.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
<b>Overall Quality Determination</b>							

HERO ID: 3859385 Table: 16 of 16

Study Citation:	Virta, R. L. (2004) Other Properties	. Asbestos. 3:288-319.					
Template:	Other Properties						
HERO ID:	3859385						
	EXTRACTION						
Parameter		Data					
CASRN and Test Material		12001-29-5; chrysotile					
Confidentiality, Type, and C	Guideline	none; not specified; not specified					
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR					
Results Value		zeta potential: +13.6 to +54 (surface charged)	ge, mV); resistanc	e to acids: weak, undergoes fairly rapid attack; resistance to alkalies: very good			
Results Details		chrysotile fibers tend to become negative	after weathering a	nd/or leaching			
Results Remarks		not reported					
			EVALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	Hıgh	Measured data are consistent with the subject chemical substance structural features.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3 <sup>,</sup> Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Quality Determination High							

Study Citation: OECD Harmonized	Zhong, Q., Liao, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Black Nephrite Jade from Guangxi, Southern China. Gems & Gemology 55(2):198-215. Other Properties				
HERO ID:	6880237				
			EXTRACTIO	N	
Parameter	Parameter Data				
CASRN and Test Material		12172-67-7; Actinolite			
Confidentiality, Type, and C	Guideline	None; Experimental; Gemological proper	ties and mineral co	ompositions of black nephrite from Guangxi	
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR			
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR			
Results Value		Luster: Greasy to vitreous			
Results Details		Not Reported			
Results Remarks		4 samples containing 60-99% ferro-actine	olite		
			EVALUATION	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabili	ity				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific ques- tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
<b>Overall Qualit</b>	Overall Quality Determination High				

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Other Properties

Study Citation:	Zhong, Q., Liao	, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Blad	ck Nephrite Jade	from Guangxi, Southern China. Gems & Gemology 55(2):198-215.	
OECD Harmonized	Other Properties	S			
	6990227				
HERO ID:	0880237				
			EXTRACTIO	N	
Parameter		Data			
CASRN and Test Material	G · 1 1	12172-67-7; Actinolite			
Confidentiality, Type, and C		None; Experimental; Gemological properties and mineral compositions of black nephrite from Guangxi			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR Actinglite fibers were 20x0 5 um			
Results Value		Not Reported	Actinolite fibers were 20×0.5 μm		
Results Details		Not Reported			
Results Remarks		Not Reported			
			EVALUATIO	N	
Domain		Metric	Rating	Comments	
Domain 1: Substance					
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.	
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliabil	ity				
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-	
	34.1.4	(Method Objectivity)	TT: 1	tion, and the methodology's objective is clear.	
	Metric 4:	Reliability/Analytical Method	High	OECD guidelines for physical-chemical properties or other developed standard.	
Domain 3: Other					
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qualit	Overall Quality Determination High				

PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Miscellaneous

HERO ID: 3646977 Table: 1 of 3

Study Citation: OECD Harmonized	Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New York Academy of Sciences 132:23-30. Miscellaneous					
Template:						
HERO ID:	3646977					
			EXTRACTION			
Parameter		Data				
CASRN		12001-29-5				
Confidentiality, Type, and	Guideline	none: not specified: Not reported				
Solvent, Reactivity, Storage	e. and Stability	NR·NR·NR				
Radiolabel Source State and Purity		NR: NR: Solid: NR Notes: white asbestos: chemical formula 3MgO 2SiO2 2H2O				
Value		ca. 350000 lb/inch2 -				
Temperature		Not reported	Not reported			
System Not reported						
pH Not reported						
Standard Deviation Results		Not reported				
Results Details		Average tensile strength: 350000 lb./inch2				
			EVALUATION			
Domain		Metric	Rating	Comments		
Domain 1: Substance						
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.		
	Metric 2:	Appropriateness	Medium	Details have been omitted.		
Domain 2: Test Reliabil	lity					
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
		(Method Objectivity)		towards a particular product or outcome.		
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.		
Domain 3: Other						
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.		
Overall Qualit	ty Determi	nation	Medium			

Page 518 of 522

#### PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Miscellaneous

HERO ID: 3646977 Table: 2 of 3

Study Citation:	Gaze, R. (1965).	The Physical and Molecular Structure o	f Asbestos. Annals of	the New York Academy of Sciences 132:23-30.			
Templete:	wiscenatieous						
HERO ID:	3646977						
EXTRACTION							
Parameter		Data					
CASRN	~	12172-73-5					
Confidentiality, Type, and C	Juideline	none; not specified; Not reported	none; not specified; Not reported				
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR					
Radiolabel, Source, State, and Purity		NR; NR; Solid; NR Notes: chemical formula 1.5MgO 5.5FeO 8SiO2 H2O					
Value		ca. 175000 lb./inch2 -	ca. 175000 lb./inch2 -				
Temperature		Not reported	Not reported				
System Not reported							
рН		Not reported	Not reported				
Standard Deviation Results		Not reported					
Results Details		Average tensile strength: 175000 lb./inch2					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	Medium	Details have been omitted.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)	1,100,101,11	towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
Domain 5. Other	Metric 5	Databases	NI/A	Pating of this factor is not applicable to this kind of information			
	Metric 5.	Models		Rating of this factor is not applicable to this kind of information.			
	wieure o.	INIOUCIS	IN/A	Raung of uns factor is not applicable to uns kind of information.			
<b>Overall Qualit</b>	ty Determin	nation	Medium				

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024 Miscellaneous

HERO ID: 3646977 Table: 3 of 3

Study Citation: Gaze, R. (1965). The Physical and Molecular Structure of Asbestos. Annals of the New Y   OECD Harmonized Miscellaneous			f the New York Academy of Sciences 132:23-30.				
HERO ID:	3646977						
			EXTRACTION				
Parameter		Data					
CASRN		12001-28-4					
Confidentiality, Type, and	Guideline	none; not specified; Not reported	none; not specified; Not reported				
Solvent, Reactivity, Storage, and Stability		NR; NR; NR; NR	NR; NR; NR				
Radiolabel, Source, State, and Purity		NR; NR; Solid; NR Notes: blue asbestos; chemical formula Na2O 3FeO Fe2O3 8SiO2 H2O					
Value		ca. 500000 lb./inch2 -	ca. 500000 lb./inch2 -				
Temperature		Not reported	Not reported				
System Not reported							
pH		Not reported					
Standard Deviation Results		Not reported					
Results Details		Average tensile strength: 500000 lb./inch2					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain 1: Substance							
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness	Medium	Details have been omitted.			
Domain 2: Test Reliabil	ity						
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
		(Method Objectivity)		towards a particular product or outcome.			
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.			
Domain 3: Other							
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			
Overall Qualit	ty Determi	nation	Medium				

List of Abbreviations and Acronyms for Data Quality Evaluation and Extraction Tables

Term	Definition
ASTM	American Society for Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
atm	Atmospheres
$atm \cdot m^3/mol$	Atmospheres - cubic meters per mole
C	Celsius
CASRN	Chemical Abstract Service registry number
cP	Centipoise
CRC	CRC Handbook of Chemistry and Physics
DOE	U.S. Department of Energy
ECB	European Chemicals Bureau
EPA	Environmental Protection Agency
F	Fahrenheit
GC	Gas Chromatography
g/cm <sup>3</sup>	Grams per cubic centimeter
GLP	Good Laboratory Practice
HLC	Henry's Law Constant
HPV	High Production Volume
HSDB	Hazard Substance Data Bank
ILO	International Labour Organization
IPCS	International Programme on Chemical Safety
IUCLID	International Uniform Chemical Information Database
K	Kelvin
Koa	Octanol-Air partition coefficient
Kow	Octanol-Water partition coefficient
mg/L	Milligrams per Liter
mol	Mole
mmHg	Millimeters of Mercury
MS	Mass Spectrometry
N/A	Not Applicable
NICNAS	National Industrial Chemicals Notification and Assessment Scheme
NLM	National Library of Medicine
NR	Not Reported
OECD	Organisation for Economic Co-operation and Development
Pa (hPa)	Pascals (hectopascals; 1 hPa = 100 Pa)
pH	Negative base 10 Log of Hydrogen Ion (H+) Concentration in Aque-
	ous Solution
рКа	Negative base 10 Log of Acid Dissociation Constant (Ka)
RIVM	National Institute for Public Health and the Environment (Dutch: Ri-
	jksinstituut voor Volksgezondheid en Milieu)

# PUBLIC RELEASE DRAFT – DO NOT CITE OR QUOTE April 2024

List of Abbreviations and Acronyms for Data Quality Evaluation and Extraction Tables

Term	Definition
RSC	Royal Society of Chemistry
RT	Retention Time
SIDs	Screening Information Dataset
VP	Vapor Pressure
US or USA	United States of America
UV (UV-Vis)	Ultra Violet (UV-Visible)
WHO	World Health Organization

#### ... continued from previous page