

Data Quality Evaluation and Data Extraction Information for Physical and Chemical Properties for Asbestos Part 2 – Supplemental Evaluation Including Legacy Uses and Associated Disposals of Asbestos

Systematic Review Support Document for the Risk Evaluation

CASRN: 1332-21-4

This supplemental file contains information regarding the data extraction and evaluation results for data sources that were considered for the Supplement to the *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 *Risk 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.

HERO ID	Reference	Page
Physical Form or State		
1009583	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
3084215	Bouffant, Le, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33.	31
3981007	Cameo Chemicals, (2016). Chemical datasheet: asbestos.	32
3981008	Cameo Chemicals, (2016). Chemical datasheet: asbestos (blue).	33
3646977	Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.	34
7607106	Haz-Map, (2021). Haz-Map: Asbestos.	38
7607107	Haz-Map, (2021). Haz-Map: Anthophyllite.	40
3970851	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite).	42
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
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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 information 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
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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, B., T.J., 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
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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-Górecka, D., Macherzyński, B., Kisiel, M. (2019). Thermal decomposition of asbestos fiber from asbestos cement wastes. Rocznik Ochrona Środowiska 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
Boiling Point		
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Density		
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3859385	Virta, R. L. (2004). Asbestos. 3:288-319.	218
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Particle Size		
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3531545	Wagner, J. (2015). Analysis of serpentine polymorphs in investigations of natural occurrences of asbestos. Environmental Science: Processes & Impacts 17(5):985-996.	311
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.	313
3531568	Wu, L., Ortiz, C. P., Jerolmack, D. J. (2017). Aggregation of Elongated Colloids in Water. Langmuir 33(2):622-629.	315
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192177	NIOSH, (2007). NIOSH pocket guide to chemical hazards.	321
3974865	NIOSH, (2016). NIOSH pocket guide to chemical hazards: Asbestos.	322
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logKow		
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786664	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).	324
3860485	(2017). PubChem: Chrysotile.	329
3860486	(2017). PubChem: Crocidolite.	330

3975020	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.	331
Flash Point		
Autoflammability		
рКа		
Viscosity		
Refractive Index		
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7924733	NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.	368
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.	369
3827272	U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System (IRIS).	37
6887461	Verkouteren, J. R., Wylie, A. G., Steel, E. B., Lim, M. S. (1995). Analysis of the tremolite/actinolite series using high precision refractive index measurements. Microbeam Analysis:27-28.	375
3859385	Virta, R. L. (2004). Asbestos. 3:288-319.	370
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.	380
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.	39
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 surface composition on genotoxicity in vitro. Journal of Toxicology and Environmental Health, Part A: Current Issues 57(8):529-541.	393
3078027	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 Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering 49(6):617-624.	394

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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.	403
7475373	Schiller, J. E., Payne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibers.	412
3975020	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.	416
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.	419
3531568	Wu, L., Ortiz, C. P., Jerolmack, D. J. (2017). Aggregation of Elongated Colloids in Water. Langmuir 33(2):622-629.	420
Dielectric Constant		
7924810	Elsevier, (2021). Reaxys: physical-chemical property data for Chrysotile.	421
7924814	Elsevier, (2021). Reaxys: physical-chemical property data for Tremolite.	422
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.	423
3827307	Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.	426
3099513	Bartosiewicz, L. (1973). Improved Techniques of Identification and Determination of Airborne Asbestos. American Industrial Hygiene Association Journal 34(6):252-259.	462
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.	463
3970851	IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite).	469
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.	475
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3581901	Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research 23(2):348-361.	480
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.	485
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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.	515
Miscellaneous		
3646977	Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.	517
List of Abbreviations and Acronyms for I	Data Quality Evaluation and Extraction Tables	520

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

DECD Harmonized

Template: HERO ID:

Physical Form or State 1009583

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; chrysotile

Confidentiality, Type, and Guideline None; experimental; not reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; fibers; NR

Results Value colorless to light brown upon being heated; nonpleochroic

			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)	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 Qual	ity Determ	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

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EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; chrysotile

Confidentiality, Type, and Guideline None; experimental; not reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; fibers; NR

Results Value wavy fibers with kinks; splayed ends on larger bundles

			EVALUATIO	N
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	N/A	Rating of this factor is not applicable to this kind of information.
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	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 Qua	lity Determi	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template:

Physical Form or State

HERO ID:

Parameter

1009583

CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability

12001-28-4; crocidolite None; experimental; not reported

NR; NR; NR; NR

Data

Radiolabel, Source, State, and Purity Results Value

None; NR; fibers; NR Notes: riebeckite characteristic blue color; pleochroic

			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)	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 Qual	ity Determi	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template:

Parameter

D Harmonized Physical Form or State

HERO ID: 1009583

EXTRACTION

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 None; NR; fibers; NR Notes: Reported as: Crocidolite (Riebeckite)

Data

Results Value straight fibers and fiber bundles; longer fibers show curvature; splayed ends on bundles

			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 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	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 Qual	ity Determi	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template:

Physical Form or State

HERO ID: 1009583

EXTRACTION

Parameter Data

CASRN and Test Material 17068-78-9; anthophyllite Confidentiality, Type, and Guideline None; experimental; not reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; fibers; NR

Results Value straight fibers and fiber bundles; cleavage fragments may be present.

			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)	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 Qual	ity Determ	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template:

Physical Form or State

HERO ID: 1009583

EXTRACTION

Parameter Data

CASRN and Test Material 17068-78-9; anthophyllite Confidentiality, Type, and Guideline None; experimental; not reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; fibers; NR

Results Value colorless to light brown; non-pleochroic to weakly pleochroic

			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)	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 Qual	ity Determi	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template:

Physical Form or State

HERO ID: 1009583

EXTRACTION

Parameter Data

CASRN and Test Material 14567-73-8; tremolite

Confidentiality, Type, and Guideline None; experimental; not reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; fibers; NR

Results Value straight and curved fibers; cleavage fragment common; large fiber bundles show splayed ends

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	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	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 Qual	ity Determi	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template: **HERO ID:**

Parameter

Physical Form or State

1009583

EXTRA	ACTION

CASRN and Test Material 14567-73-8; tremolite Confidentiality, Type, and Guideline

Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity

Results Value Results Details

None; experimental; not reported NR; NR; NR; NR

None; NR; fibers; NR

colorless Not Reported

Data

			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 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	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 Qual	ity Determi	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template:

Physical Form or State

HERO ID:

1009583

EXTRACTION

Parameter Data

CASRN and Test Material 13768-00-8; actinolite

Confidentiality, Type, and Guideline None; experimental; not reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; fibers; NR

Results Value straight and curved fibers; cleavage fragment common; large fiber bundles show splayed ends

			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 (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 Qual	ity Determ	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template:

Physical Form or State

HERO ID:

Parameter

1009583

EXTRACTION

CASRN and Test Material 13768-00-8; actinolite

Confidentiality, Type, and Guideline None; experimental; not reported Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity None; NR; fibers; NR

Results Value green; weakly to moderately pleochroic

Data

			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)	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 Qual	ity Determi	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template:

Physical Form or State

HERO ID: 1009583

EXTRACTION

Parameter Data

CASRN and Test Material 12172-73-5; cummingtonite-grunerite (amosite)

Confidentiality, Type, and Guideline None; experimental; not reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity None; NR; fibers; NR Notes: amosite

Results Value straight fibers and fiber bundles; bundle ends appear broom-like or 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	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)	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 Qual	ity Determ	ination	High	

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Template:

Physical Form or State

HERO ID:

Parameter

1009583

EXTR	AC	rt <i>(</i>	N

CASRN and Test Material 12172-73-5; cummingtonite-grunerite (amosite) Confidentiality, Type, and Guideline None; experimental; not reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity None; NR; fibers; NR Notes: amosite

Results Value colorless to brown upon heating; may be weakly pleochroic

Data

			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)	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 Qual	ity Determi	ination	High	

Study Citation:	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).
OECD Harmonized	Physical Form or State
Template:	
HERO ID:	786664

		EXTRACTION
Parameter	Data	

CASRN and Test Material 17068-78-9; anthophyllite
Confidentiality, Type, and Guideline none; not specified; not specified
Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, 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				
	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	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.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).

Template:

HERO ID: 786664

EXTRACTION

CASRN and Test Material Confidentiality, Type, and Guideline

Solvent, Reactivity, Storage, and Stability

Radiolabel, Source, State, and Purity

Results Value Results Details

Parameter

12001-28-4; crocidolite

none; not specified; not specified

NR; NR; NR; NR

NR; NR; solid; NR Notes: NR

solid

Data

Physical Form or State

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 Reliabi	lity			
	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				
Domain 3. Other	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.

ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).

Template:

Physical Form or State

Parameter

Results Value

HERO ID: 786664

EXTRACTION
LATINACTION

CASRN and Test Material 12172-73-5; amosite Confidentiality, Type, and Guideline none; not specified; not specified

Data

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity

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 Reliab	ility			
	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.
Overall Quali	ity Determ	ination	High	

ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).

Physical Form or State

Template:

Parameter

Results Value

Results Details

HERO ID: 786664

FYTR	ACTION

CASRN and Test Material
Confidentiality, Type, and Guideline
Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity

12001-29-5; chrysotile

none; not specified; not specified

NR; NR; NR; NR

NR; NR; solid; NR Notes: NR

solid

Data

white, gray, green, yellowish

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

ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).

Template:

Physical Form or State

Parameter

HERO ID: 786664

EXTRACTION

CASRN and Test Material

14567-73-8; tremolite

Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability none; not specified; not specified

Radiolabel, Source, State, and Purity

NR; NR; NR; NR

NR; NR; solid; NR Notes: NR

Results Value

solid

Data

Results Details

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 Reliab	oility			
	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.

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

Template:

HERO ID: 733675

ACTION -

Parameter	Data
CASRN and Test Material	12172-73-5; Amosite
Confidentiality, Type, and Guideline	None; Experimental; None
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: cummingtonite-grunerite
Results Value	Brown asbestos
Results Details	Amphibole mineral group, Mg7(OH)2Si8O22 Fe7(OH)2Si8O22

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

Bignon, J. (1989). Mineral fibres in the non-occupational environment. IARC Scientific Publication no. 90:3-29.

Template:

Physical Form or State

Parameter

HERO ID: 733675

CASRN and Test Material 12001-28-4; Crocidolite Confidentiality, Type, and Guideline None; Experimental; None

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR Notes: riebeckite

Results Value Blue asbestos

Results Details Amphibole mineral group, Na2Fe2 3+ Fe2+(OH)2Si8O22

Data

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	oility					
	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.		
	Metric 4.	Renability/Analytical Method	IV/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 Qual	ity Determ	ination	High			

Bignon, J. (1989). Mineral fibres in the non-occupational environment. IARC Scientific Publication no. 90:3-29.

OECD Harmonized Template:

Physical Form or State

Template: HERO ID:

Parameter

ID: 733675

EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile Confidentiality, Type, and Guideline None; Experimental; None

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Results Value White asbestos

Results Details Serpentine mineral group, (MgFe)6(OH)8Si4O10

Data

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	bility					
	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.		
	Metric 4.	Renaomity/Anarytical Method	IVA	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 Qual	lity Determ	ination	High			

Study Citation:
OECD Harmonized

Bouffant, Le, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33. Physical Form or State

Template:

HERO ID: 3084215

EXTR	ACTION

	EXTRACTION
Parameter	Data
CASRN and Test Material	12001-29-5; chrysotile
Confidentiality, Type, and Guideline	None; Experimental; not applicable
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; Solid; NR Notes: NR
Results Value	Solid
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's physical/chemical properties.	
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	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 source.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	

Study Citation:
OECD Harmonized

Cameo Chemicals, (2016). Chemical datasheet: asbestos.

Physical Form or State

Template:

HERO ID: 3981007

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H.A.I	K 4				

Parameter Data

CASRN and Test Material 1332-21-4; Asbestos

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 Notes: NR

Results Value Slender, strong, flexible fibers; white, gray, green, 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	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	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.

Study Citation:	
OECD Harmonized	

Cameo Chemicals, (2016). Chemical datasheet: asbestos (blue). Physical Form or State

Template:

HERO ID: 3981008

FVTD	ACTION
	AC 11011

Parameter	Data
CASRN and Test Material	12001-28-4; Crocidolite
Confidentiality, Type, and Guideline	None; Experimental; Not applicable
Solvent, Reactivity, Storage, and Stability	NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; Not Reported; NR Notes: NR Results Value Slender, fine, flaxy fiber; blue

			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	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	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 Quali	ity Determ	ination	High	

Study Citation:	Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.
OECD Harmonized	Physical Form or State
Template:	
HERO ID:	3646977

EXTRACTION				
Data				
12001-29-5; Chrysotile				
None; not specified; not specified				
NR; NR; NR				
NR; NR; Solid; NR Notes: white asbestos; chemical formula 3MgO 2SiO2 2H2O				
Typical chemical analysis of solid				
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% Magnesium 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	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	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
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Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.

Template:

Physical Form or State

Parameter

HERO ID: 3646977

EXTRACTION

12001-28-4; Crocidolite CASRN and Test Material

Confidentiality, Type, and Guideline None; not specified; not specified

Data

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, 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	
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	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 waused.
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

Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.

Template:

Physical Form or State

Parameter

HERO ID: 3646977

EXTRACTION

CASRN and Test Material 12172-73-5; Amosite

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; Solid; NR Notes: chemical formula 1.5MgO 5.5FeO 8SiO2 H2O

Data

Results Value Typical chemical analysis of solid

Results Details 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

			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	Low	The analytical method is unknown and there is no indication that a reliable method waused.
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

Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30. Physical Form or State

Template:

HERO ID: 3646977

EXTRACTION

Parameter Data

CASRN and Test Material 77536-67-5; Anthophyllite
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; Solid

Results Value

Results Details

NR; NR; Solid; NR Notes: chemical formula 7MgO 8SiO2 H2O; CAS 17068-78-9

Typical chemical analysis of solid

57.2% Silica (SiO2), 10.1% Ferrous oxide (FeO), 0.1% Ferric oxide (FeO3), 1.0% Calcium oxide (CaO), 29.2% Magnesium oxide (MgO), 0.1%

Sodium oxide (Na2O), 0.1% Potassium oxide (K2O), 2.2% 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 (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

Study Citation:
OECD Harmonized

Haz-Map, (2021). Haz-Map: Asbestos. Physical Form or State

Template:

HERO ID: 7607106

EXTR	A	CT	TC	N	

Parameter	Data
CASRN and Test Material	1332-21-4; Asbestos
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, and Purity	Not Reported; Not Reported; Not Reported; Not Reported Notes: Chrysotile; Amosite; Crocidolite; Anthophylite; Tremolite; Actinolite; CAS Numbers: 1332-21-4; 12001-28-4; 12172-73-5; 77536-66-4; 77536-67-5; 77536-68-6; 132207-32-0
Results Value	solid
Results Details	Chrysotile is a curly fiber in intertwined bundles; Amphiboles 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: 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	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 Qual	ity Determ	ination	High	

^{*} Related References: Cites: 'Sullivan p. 1215'

Haz-Map, (2021). Haz-Map: Asbestos. Physical Form or State

OECD Harmonized

Template: HERO ID:

7607106

EXTR	Δ	CT	M	N

	EXTRACTION
Parameter	Data
CASRN and Test Material	1332-21-4; Asbestos
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, and Purity	Not Reported; Not Reported; Not Reported; Not Reported Notes: Chrysotile; Amosite; Crocidolite; Anthophylite; Tremolite; Actinolite; CAS Numbers: 1332-21-4; 12001-28-4; 12172-73-5; 77536-66-4; 77536-67-5; 77536-68-6; 132207-32-0
Results Value	solid
Results Details	White or greenish (chrysotile), blue (crocidolite), or gray-green (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 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	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 Qual	ity Determi	ination	High	

^{*} Related References: Cites: NIOSH

Study Citation:	
OECD Harmonized	

Haz-Map, (2021). Haz-Map: Anthophyllite.

Physical Form or State

Template:

HERO ID: 7607107

EXTRACTION

Parameter	Data
CASRN and Test Material	17068-78-9; Anthophyllite
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, 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 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	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 includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

^{*} Related References: Value reported under HERO ID for Primary source: IARC 2012 HERO ID 3970851

Study Citation:	
OECD Harmonized	
Template:	

Haz-Map, (2021). Haz-Map: Anthophyllite.

Physical Form or State

Template:

Parameter

Results Value

HERO ID: 7607107

EVTD	ACTION
LAIN	ACTION

CASRN and Test Material
Confidentiality, Type, and Guideline
Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity

17068-78-9; Anthophyllite none; not specified; not specified

NR; NR; NR; NR

NR; NR; solid; NR Notes: NR

solid

Data

Results Details White or gray fibrous 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 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	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 secondary 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 Quality Determination

Medium

^{*} Related References: Cites: SPI MSDS

Study Citation:		IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and				
OECD Harmonized	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				
Radiolabel, Source, State,	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	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	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.		

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:	IARC, (2012).	ARC Monographs on the evaluation of ca	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
•	anthophyllite).		C	•
OECD Harmonized	Physical Form of	or State		
Template:				
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and	Guideline	none; not specified; None		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR		
Radiolabel, Source, State,	and Purity	None; NR; solid; NR		
Results Value		Curled sheet silicate, hollow central core		
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	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	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	tv Determi	nation	High	

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of o	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Physical Form of	or State		
Template:	injoien i omi	51 5 tale		
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and G	uideline	none; not specified; none		
Solvent, Reactivity, Storage,	and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, ar	nd Purity	None; NR; solid; NR		
Results Value		white, grey, green, yellowish		
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 Reliabilit	•			
	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	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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Physical Form	or State		
Template:	r nysicai r omi	or state		
HERO ID:	3970851			
iieko ib.	3770031		EVED A CELO	AT
Parameter		Data	EXTRACTIO	IN .
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and	Guideline	none; not specified; none		
Solvent, Reactivity, Storage		NR; NR; NR		
Radiolabel, Source, State,		None; NR; solid; NR		
Results Value	-	brown, grey, greenish		
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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:	IARC, (2012).	ARC Monographs on the evaluation of c	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
•	anthophyllite).			
OECD Harmonized	Physical Form of	or State		
Template:				
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	rse fibers	
Results Details		Not Reported		
			EVALUATIO]	X 7
Domain		Metric	Rating	Comments
Domain 1: Substance		Wettic	Kattiig	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	; t.,			
Domain 2. Test Kellabii	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Metric 3.	(Method Objectivity)	Mediuiii	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.
D : 2 OI				
Domain 3: Other	M	D ()	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 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 Dotormi	nation	High	

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of c	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Physical Form of	or State		
Template:	i ily sicui i oi ili (or state		
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-67-5; anthophyllite		
Confidentiality, Type, and	Guideline	none; not specified; none		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	None; NR; solid; NR		
Results Value		double chain silicate; short, very brittle f	ìbers	
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	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	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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Physical Form	or State		
Template:	i ny sicar i orm	or state		
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, Storag	e, 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		
			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 (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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Physical Form of	or State		
Template:	, 5.20 1 51111 (
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-67-5; anthophyllite		
Confidentiality, Type, and	Guideline	none; not specified; none		
Solvent, Reactivity, Storag	e, 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		
			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	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	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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD II . I	anthophyllite).	G		
OECD Harmonized	Physical Form	or State		
Template: HERO ID:	3970851			
некотр:	39/0831			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-66-4; actinolite		
Confidentiality, Type, and	Guideline	none; not specified; none		
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	None; NR; solid; NR		
Results Value		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 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	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	tv Determi	nation	High	

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

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:	1 11/01041 1 01111	or State				
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	and Purity	None; NR; solid; NR				
Results Value		white to pale 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	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	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 Determi	nation	High			

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of ca	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite).	an Stata		
Template:	Physical Form	or State		
HERO ID:	3970851			
neko ib.	3770031			
Parameter		Data	EXTRACTIO	N
1 ai ailletei		Data		
CASRN and Test Material		77536-68-6; tremolite		
Confidentiality, Type, and	Guideline	none; not specified; none		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR		
Radiolabel, Source, State,	and Purity	None; NR; solid; NR		
Results Value		double chain silicate; brittle fibers		
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 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	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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		IARC, (2012). ARC Monographs on the evaluation of carcinogenic risks to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and					
OECD Harmonized	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, Storag	e, and Stability	NR; NR; NR					
Radiolabel, Source, State,	and Purity	None; NR; solid; NR					
Results Value		double chain silicate					
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	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	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.			

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:	
OECD Harmonized	

(2017). PubChem: Chrysotile. Physical Form or State

Template:

HERO ID: 3860485

EXTR	A	CT	TC	N	

CASRN and Test Material 12001-29-5; Chrysotile
Confidentiality, Type, and Guideline none; not specified; Not Reported
Solvent, Reactivity, Storage, and Stability NR; NR; NR
Radiolabel, Source, State, and Purity 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 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	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: OSHA Occupational Chemical DB (not a primary source)

(2017). PubChem: Chrysotile. Physical Form or State

Data

Template:

Parameter

HERO ID: 3860485

EXTR.	ACT	rt <i>(</i>	M
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CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline none; not specified; Not Reported Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Results Value White or greenish (chrysotile), blue (crocidolite), or gray-green (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 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 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: N/OSH-PocketGuide, OSHA Occupational Chemical DB (not a primary source)

(2017). PubChem: Chrysotile. Physical Form or State

Template:

HERO ID: 3860485

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EXTR	ΑC	11()	N

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile
Confidentiality, Type, and Guideline none; not specified; Not Reported
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Results Value Curled sheet silicate, spiraled as helix around central capillary; fibrous member of serpentine mineral group possessing rolled trioctahedral clay

Results Details Structure.

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 Reliab	oility			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	3.5	(Method Objectivity)	37/1	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)

(2017). PubChem: Chrysotile. Physical Form or State

Template:

Parameter

HERO ID: 3860485

EXTR.	ACT	rt <i>(</i>	M
	~~		,,,

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline none; not specified; Not Reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Results Value White, grey, green or yellowish fibrous solid.

Data

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	Data are consistent with the subject chemical substance structural features.		
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 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 Ouality Determ	ination	High			

^{*} Related References: Source: ILO-ICSC (not a primary source)

(2017). PubChem: Chrysotile. Physical Form or State

Template:

HERO ID: 3860485

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline none; not specified; Not Reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Results Value Crystal system: monoclinic (pseudoorthorhombic); usually white to grayish green; may have tan coloration.

Results Details Not Reported

			EVALUATIO	N Company of the Comp
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 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	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.

^{*} 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)

Study Citation:
OECD Harmonized

(2017). PubChem: Crocidolite. Physical Form or State

Template:

HERO ID: 3860486

EXTR	ACTION	

EXTRACTION				
Parameter	Data			
CASRN and Test Material	12001-28-4; crocidolite			
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 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 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	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

^{*} Related References: Citing ILO-ICSC.

Study Citation:	
OECD Harmonized	

(2017). PubChem: Crocidolite. Physical Form or State

Template:

HERO ID: 3860486

FXTR	ACTION	

Parameter	Data
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: NA
Results Value	solid
Results Details	blue fibrous, odorless solid

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	N/A	Rating of this factor is not applicable to this kind of information.		
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	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 Qua	lity Determ	ination	High			

^{*} Related References: Citing OSHA Occupational Chemical DB.

Study Citation:
OECD Harmonized

(2016). Agent name: Anthophyllite.

Physical Form or State

Template:

Parameter

HERO ID: 3860489

DXZDD	ACTION	
HXIR	ACTION	

CASRN and Test Material	17068-78-9; Anthophyllite
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

Results Value Gray, white, brown-gray, or green solid; White or gray fibrous solid

Data

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 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	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: IARC and SPI MSDS

Study Citation:	NIH, (2016). Report on carcinogens: Asbestos.
OECD Harmonized	Physical Form or State
Template:	

HERO ID: 3982328

EXTRACTION			
Parameter	Data		
CASRN and Test Material	1332-21-4; actinolite		
Confidentiality, Type, and Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR		
Radiolabel, Source, State, and Purity	NR; Not Reported; solid; NR Notes: common 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 Reliabilit	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	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.

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

NIH, (2016). Report on carcinogens: Asbestos.

OECD Harmonized

Physical Form or State

Template:

HERO ID: 3982328

EXTRACTION

Parameter Data

CASRN and Test Material 1332-21-4; tremolite

Confidentiality, Type, and Guideline none; not specified; not specified

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; Not Reported; solid; NR Notes: common 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 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	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 Qual	lity Determi	ination	High	

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

NIH, (2016). Report on carcinogens: Asbestos.

Data

OECD Harmonized

Physical Form or State

Template:

Parameter

HERO ID: 3982328

EXTRACTION

CASRN and Test Material 1332-21-4; amosite

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; solid; NR

Results Value solid fibers, long, straight, coarse, somewhat 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.
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	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.

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

NIH, (2016). Report on carcinogens: Asbestos.

OECD Harmonized

Physical Form or State

Template:

HERO ID: 3982328

EXTRACTION

Parameter Data

CASRN and Test Material 1332-21-4; chrysotile

Confidentiality, Type, and Guideline none; not specified; not specified

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; occurs naturally; solid; NR Notes: composition: Mg3Si2O5(OH)4

Results Value solid; curled sheet silicate, which wraps around itself forming hollow tubular fibers

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 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	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 Qual	ity Determi	ination	High	

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

Study	Citation:
OFOR	

NIH, (2016). Report on carcinogens: Asbestos.

OECD Harmonized Template:

Physical Form or State

Template: HERO ID:

3982328

EXTR	Δ (\neg	T	n	N

Parameter	Data
CASRN and Test Material	1332-21-4; anthophyllite
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR
Radiolabel, Source, State, 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	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	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	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 Qua	lity Determ	ination	High	

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

NIH, (2016). Report on carcinogens: Asbestos.

Data

OECD Harmonized

Harmonized Physical Form or State

Template:

Parameter

HERO ID: 3982328

EXTRACTION

CASRN and Test Material 1332-21-4; crocidolite

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; solid; NR

Results Value shorter, thinner fibers compared to other amphiboles; not as thin as chrysotile

Results Details lavender or blue; good flexibility and fair 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: 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	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 Qual	lity Determi	ination	High	

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

NIOSH, (2007). NIOSH pocket guide to chemical hazards.

Physical Form or State

Template:

HERO ID: 192177

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Parameter Data

CASRN and Test Material 1332-21-4; Asbestos

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

Results Value White or greenish (chrysotile), blue (crocidolite), or gray-green (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 Reliab	oility			
	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.
	Wietrie 4.	Kenaomity/Anarytical Method	IVA	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.
Overall Qual	ity Determ	ination	High	

Study Citation:	NIOSH, (2016). NIOSH pocket guide to chemical hazards: Asbestos.
OECD Harmonized	Physical Form or State

Template:

HERO ID: 3974865

EXTRACTION

Parameter	Data
CASRN and Test Material	1332-21-4; Asbestos
Confidentiality, Type, and Guideline	None; Experimental; None
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Results Value	Fibrous, odorless solids. White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite).
Results Details	Not Reported

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	2			
	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 Relia	ability			
	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.
Overall Quality Determination		High		

^{*} Related References: None cited.

NIOSH, (2014). International chemical safety cards (ICDC): Chrysotile.

ECD Harmonized Physical Form or State

Template:

HERO ID: 3978149

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile

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

Results Value White, grey, green or yellowish fibrous solid

Results Details None

			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 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	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.

Study Citation:	
OECD Harmonized	
Template:	

Parameter

NIOSH, (2014). International chemical safety cards (ICDC): Crocidolite.

Physical Form or State

3978150 HERO ID:

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CASRN and Test Material	12001-28-4; Crocidolite
Confidentiality, Type, and Guideline	None; Experimental; None
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR
Radiolabel Source State and Purity	NR · NR · NR · NR Notes · riebeck

Data

Reported as Fibres Results Value Results Details Blue asbestos

Domain	Metric	EVALUATIO Rating	Comments
Domain 1: Substance	Metric	Rating	Comments
	D	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's physical/chemical 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 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.

Study Citation: OECD Harmonized		NIOSH, (2019). NIOSH pocket guide to chemical hazards: Asbestos. Physical Form or State				
Template: HERO ID:	9109830					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		1332-21-4; Asbestos				
Confidentiality, Type, and	Guideline	none; not specified; not specified				
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR				
Radiolabel, Source, State,	and Purity	NR; NR; NR Notes: Hydrated mineral silicates				
Results Value		solid				
Results Details		White or greenish (chrysotile), blue (crocidolite), or gray-green (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 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	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		

Overall Quality Determination

Metric 6:

Models

N/A

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.

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

^{*} Related References: Primary reference not reported in this secondary source.

Study Citation:		Toxicological review of libby amphi	bole asbestos:	In support of summary information on the Integrated Risk Information System		
OECD Harmonized	(IRIS). ECD Harmonized Physical Form or State					
Template:	Thysical Form of C	nate				
HERO ID:	3827272					
			EXTRACTIO	N .		
Parameter		Data		-1		
CASRN and Test Material		1332-21-8; Libby amphibole				
Confidentiality, Type, and	Guideline	none; Experimental; not specified				
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR				
Results Value		Surface area (m2/g): 1.1-7.4				
Results Details		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				
			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 subject chemical 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 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.		

^{*} 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:		4). Toxicological review of libby amphi	ibole asbestos:	In support of summary information on the Integrated Risk Information System
OECD Harmonized	(IRIS). Physical Form of	or State		
Template:	,			
HERO ID:	3827272			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		1332-21-8; Libby amphibole		
Confidentiality, Type, and	Guideline	none; Experimental; not specified		
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR Notes: NR		
Results Value		Essential composition: Winchite (84%), 1	richterite (11%), a	nd tremolite (6%).
Results Details				
			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	The metric is not applicable to the study type.
Domain 2: Test Reliabil	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.
Overall Quali	ty Determi	nation	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.

Study Citation: U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System

(IRIS).

OECD Harmonized

Physical Form or State

Template: HERO ID:

3827272

Parameter	Data
CASRN and Test Material	77536-66-4; actinolite
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	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 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	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 Quality Determination Medium

Study Citation: U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System

(IRIS).

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Physical Form or State

Template: HERO ID:

3827272

EXTRACTION

Parameter	Data
CASRN and Test Material	77536-68-6; tremolite
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: 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 Relia	bility			
	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	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 Quality Determination Medium

Study Citation:	U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System
	(IRIS).
OECD Harmonized	Physical Form or State
Template:	
HERO ID:	3827272

Parameter

Data

CASRN and Test Material
Confidentiality, Type, and Guideline
Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity
Results Value
Results Details

Results Details

EXTRACTION

EXTRACTION

EXTRACTION

EXTRACTION

17068-76-7; richterite
none; not specified; not specified
NR; NR; NR; NR; NR
NR; NR; NR
NR; NR; NR
Straight to curved fibers and bundles.
Colorless, pale yellow, brown, pale to dark green, or violet.

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	2			
	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	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	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 Medium

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

Study Citation: U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System

(IRIS).

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Physical Form or State

Template: HERO ID:

Results Details

3827272

Parameter	Data
CASRN and Test Material	12425-92-2; winchite
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Results Value	Straight to curved fibers and bundles.

			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	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 Quality Determination Medium

Colorless to pale blue.

Study Citation: USGS, (2002). OECD Harmonized Physical Form of		Asbestos: Geology, mineralogy, mining, and uses.		
Template:	111,010411011110	- 5-m·		
HERO ID:	3975020	3975020		
		EXTRACTION		
Parameter		Data		
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		NR; NR; NR Notes: NR		
Results Value		Color: usually white to grayish 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 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)	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 Qual	Overall Quality Determination High					

^{*} Related References: No citation given.

USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.

OECD Harmonized

Physical Form or State

Template: HERO ID:

ID: 3975020

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Parameter	Data	
CASRN and Test Material	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; NR; NR Notes: NR	
Results Value	Color: Cobalt blue to lavender blue	
Results Details	Not Reported	

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

^{*} Related References: No citation given.

USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.

Physical Form or State

Template: HERO ID:

3975020

EXTRACTION

Parameter	Data	
CASRN and Test Material	12172-73-5; Amosite	
Confidentiality, Type, and Guideline	None; Experimental; NR	
Solvent, Reactivity, Storage, and Stability	NR; NR; NR	
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR	
Results Value	Color: Yellowish gray to dark brown	
Results Details	Not Reported	

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

^{*} Related References: No citation given.

Study Citation:
OECD Harmonized

USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.

OECD Harmonized

Physical Form or State

Template: HERO ID:

3975020

EXT	TD.	10	ודי	$\mathbf{\Omega}$	N

Parameter	Data
CASRN and Test Material	14567-73-8; Tremolite
Confidentiality, Type, and Guideline	None; Experimental; NR
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	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: 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 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.

 $^{^{\}star}$ Related References: No citation given.

Virta, R. L. (2004). Asbestos. 3:288-319.

Physical Form or State

Template:

HERO ID: 3859385

EXT	rr.	40	TI	n	N

Parameter Data

CASRN and Test Material 12172-73-5; amosite

none; not specified; not specified Confidentiality, Type, and Guideline

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Results Value vitreous to pearly luster; coarse but somewhat pliable texture

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 Reliab	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	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 Qual	lity Determ	ination	High	

Study Citation:

Virta, R. L. (2004). Asbestos. 3:288-319.

Data

OECD Harmonized

Physical Form or State

Template:

Parameter

HERO ID: 3859385

EXTR	11	TT	ON	J
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CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability 12001-28-4; crocidolite

none; not specified; not specified

Radiolabel, Source, State, and Purity

NR; NR; NR; NR NR; NR; NR; NR Notes: NR

Results Value

silky to dull luster; soft to harsh texture

Results Details

cobalt blue to lavender blue

			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	Medium	There is no indication that the methodology for producing the information was biased
	3.5	(Method Objectivity)	3.T/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	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 Quali	ity Determ	ination	High	

Virta, R. L. (2004). Asbestos. 3:288-319.

Template:

Physical Form or State

Template: HERO ID: 3859385			
		EXTRACTIO	N .
Parameter	Data		
CASRN and Test Material	14567-73-8; tremolite		
Confidentiality, Type, and Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage, and Stabili	ty NR; NR; NR		
Radiolabel, Source, State, and Purity	NR; NR; NR; NR Notes: NR		
Results Value	silky luster; generally harsh texture		
Results Details	gray-white, green, yellow, blue		
		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 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		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.

N/A

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

Overall Quality Determination	Цiah
Overall Quality Determination	High

Models

Metric 6:

Study Citation:

Virta, R. L. (2004). Asbestos. 3:288-319.

Data

OECD Harmonized

Physical Form or State

Template: HERO ID:

Parameter

O ID: 3859385

EXTR	AC	rt <i>(</i>	N

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

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

			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 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	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 Qual	ity Determ	ination	High	

Study Citation:	Xu, X. M., Li, Y. Q., Belfiore, L. A., Tang, J. G	. (2018). Polarized light microsco	ope method for the determination of asbestos fiber of textile. Integrated
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Ferroelectrics 188(1):136-147.

Data

OECD Harmonized Template:

Parameter

Physical Form or State

HERO ID: 6860096

EXTRACTION

CASRN and Test Material 1332-21-4; Asbestos

Confidentiality, Type, and Guideline None; not specified; NA Solvent, Reactivity, Storage, and Stability NA; NR; NR; NR

Radiolabel, Source, State, and 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

			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	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				
	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	lity Determ	ination	High	

Study Citation: OECD Harmonized	Elsevier, (2021). Reaxys: physical-chemical property data for Chrysotile. Physical Form or State					
Template: HERO ID:	7924810					
			EXTRACTION			
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and	Guideline	None; Experimental; Not Rep	ported			
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State,	and Purity	NR; NR; Solid; NR				
Results Value		5 values in Reaxys - crystal p	phase: Fibers (3), needles (1) Octahedrons (1)			
Results Details		Not Reported				
			EVALUATION			
Domain		Metric	Rating	Comments		

			EVALUATIO	
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	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	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	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: 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

Study Citation:
OFCD Harmoniza

Elsevier, (2021). Reaxys: physical-chemical property data for Chrysotile.

OECD Harmonized

Physical Form or State

Template:

HERO ID: 7924810

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile
Confidentiality, Type, and Guideline None; Experimental; Not Reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR; NR Radiolabel, Source, State, and Purity NR; NR; Solid; NR

Results Value 3 values reported in Reaxys - Crystal system: monoclinic, rhombic, 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 Reliability	ý			
	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 Quality Determination High

^{*} 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). Reaxys: physical-chemical property da or State	ta for Anthophyl	lite.
Template:	•			
HERO ID:	7924812			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		17068-78-9; Anthophyllite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and Purity		NR; NR; Solid; NR		
Results Value		2 values reported in Reaxys - Crystal ph	ase: needles, prism	s
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 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	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 Quali	tv Determi	nation	High	

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

Study Citation:

Elsevier, (2021). Reaxys: physical-chemical property data for Anthophyllite.

OECD Harmonized

Physical Form or State

Template:

HERO ID: 7924812

EXTRACTION

Parameter Data

CASRN and Test Material 17068-78-9; Anthophyllite
Confidentiality, Type, and Guideline None; Experimental; Not Reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR; NR Radiolabel, Source, State, and Purity NR; NR; Solid; NR

Results Value 1 value reported in Reaxys - Crystal system: rhombic

Results Details Not Reported

	EVALUATION					
Domain		Metric		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 (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 Qual	ity Determ	ination	High			

^{*} 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:	Elsevier, (2021). Reaxys: physical-chemical property data for Tremolite.
OECD Harmonized	Physical Form or State
Template:	

7024914

HERO ID: 7924814					
		EXTRACTION			
Parameter	Data				
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, and Purity	NR; NR; Solid; NR				
Results Value	1 values reported in Reaxys -	Crystal phase: fibers. Collected using the search to	erm 'tremolite' in Reaxys.		
Results Details	Not Reported				
		EVALUATION			
Domain	Metric	Rating	Comments		

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

Study Citation:	
OFCD Harmaniza	

Elsevier, (2021). Reaxys: physical-chemical property data for Tremolite.

OECD Harmonized

Physical Form or State

Template:

HERO ID: 7924814

EXTR	Δ	CT	M	N

Parameter

CASRN and Test Material
Confidentiality, Type, and Guideline
Solvent, Reactivity, Storage, and Stability

NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; Solid; NR

Results Value 1 values reported in Reaxys - Crystal system: 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: 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 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: Bhattacherjee, S.; Paul, A.; Journal of Materials Science; ; vol. 27; (1992); p. 704 - 710

Study Citation: OECD Harmonized	Elsevier, (2021) Physical Form). Reaxys: physical-chemical property da or State	ta for Actinolite.	
Template:				
HERO ID:	7924815			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12172-67-7; Actinolite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; Solid; NR		
Results Value		1 value reported in Reaxys - Crystal syst	em: monoclinic	
Results Details		Collected using the search term 'actinoli	te' 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 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	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 Quali	tv Determi	nation	High	

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

Study Citation:	NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.
OECD Harmonized	Physical Form or State
Template:	

HERO ID: 7924733

EXTRACTION Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline None; Experimental; Not Reported

Results Value Chrystal system: monoclinic (pseudoorthorhombic)

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 Reliab	oility				
	Metric 3:	Reliability/Unbiased	Medium	m 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 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

NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

Physical Form or State

Template:

Parameter

HERO ID: 7924733

EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline None; Experimental; Not Reported

Data

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity NR; NR; Solid; NR

Results Value Curled sheet silicate, helix spiralled around a capillary. Fibrous with trioctahedral clay structure.

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	N/A	Rating of this factor is not applicable to this kind of information.	
Domain 2: Test Reliab	ility				
	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 Qual	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
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Template:

HERO ID: 3827307

EXTRACTION

Parameter	Data
CASRN and Test Material	12001-29-5; Chrysotile
Confidentiality, Type, and Guideline	None; Experimental; Not reported
Solvent, Reactivity, Storage, 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	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	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	
Template:	

onized Physical Form or State

Template: HERO ID:

3827307

		EXTRACTION
Parameter	Data	

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; NR Results Details Flexibility: fair to good

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	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	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 Quali	ity Determ	ination	High	
<u> </u>			8	

Study Citation:	
OECD Harmonized	
Template:	

Physical Form or State

HERO ID:

3827307

		EXTRACTION
Parameter	Data	

CASRN and Test Material 12172-73-5; Amosite

Confidentiality, Type, and Guideline None; Experimental; Not reported

Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity
Results Details

NR; NR; NR
Flexibility: good

Metric 1: Metric 2:	Metric Representativeness Appropriateness	Rating High N/A	Comments Data are measured for the subject chemical substance. Rating of this factor is not applicable to this kind of information.
Metric 2:	•	_	y .
Metric 2:	•	_	y .
	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information
Domain 2: Test Reliability			Rating of this factor is not appreadic to this kille of information.
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.

Study Citation:	
OECD Harmonized	
Template:	

Harmonized Physical Form or State

Template: HERO ID:

Results Details

3827307

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LAI	INA	c_{11}	UN

Parameter	Data		
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; NR		

Resistance to acids: fair; Resistance to bases: good; wt. % loss after 2 hr reflux with 25% acid or base: 4.38% (HCl), 0.91% (CH3COOH), 4.37% (H3PO4), 3.69% (H2SO4), 1.35% (NaOH); wt. % loss after 528 hr 26 deg C exposure to 25% acid or base: 3.14% (HCl), 1.02% (CH3COOH),

3.91% (H3PO4), 3.48% (H2SO4), 1.20% (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	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	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
Template:

Results Details

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

Parameter Data CASRN and Test Material 12172-73-5; Amosite 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

> Resistance to acids: fair, slowly attacked; Resistance to bases: good; wt. % loss after 2 hr reflux with 25% acid or base: 12.84% (HCl), 2.63% (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% (HCl),

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 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	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.
0 11 0 1		•	TT. 1	
Overall Qual	ity Determ	ination	High	

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.

onized Physical Form or State

HERO ID:

Parameter

3827307

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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 NR; NR; NR

Results Details Texture: generally harsh, sometimes soft

Data

			EVALUATIO1	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	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.

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:

Parameter

HERO ID: 3827307

EXTRACTION

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 Color: Gray-white, greenish, yellowish, blueish

Data

			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 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	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 Qual	lity Determ	ination	High		

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

EXTRACTION

Parameter Data

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 Radiolabel, Source, State, and Purity NR; NR; NR; NR

Results Details Color: Grayish white, brown-gray or 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 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	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 Quali	ity Determ	ination	High	

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.

Physical Form or State

HERO ID:

Parameter

3827307

EXTRACTION

CASRN and Test Material 77536-66-4; Actinolite Confidentiality, Type, and Guideline

None; Experimental; Not reported

Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity Results Details

NR; NR; NR; NR NR; NR; NR; NR Color: Greenish

Data

			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	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	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 Quali	ity Determ	ination	High	

Study Citation:
OECD Harmonized
Template:

Physical Form or State

Template: HERO ID:

3827307

	EXTRACTION
Parameter	Data
CASRN and Test Material	77536-67-5; Anthophyllite
Confidentiality, Type, and Guideline	None; Experimental; Not reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR
Results Details	Texture: harsh
	THE A VIAMINON

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) Metric 4: Reliability/Analytical Method 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	the subject chemical substance. s not applicable to this kind of information. that the methodology for producing the information was biased roduct or outcome.
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 intowards a particular product or outcome.	that the methodology for producing the information was biased roduct or outcome.
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) Reliability/Unbiased (Method Objectivity) Medium There is no indication that the methodology for producing the intowards a particular product or outcome.	that the methodology for producing the information was biased roduct or outcome.
Domain 2: Test Reliability Metric 3: Reliability/Unbiased Medium There is no indication that the methodology for producing the intowards a particular product or outcome.	that the methodology for producing the information was biased roduct or outcome.
Metric 3: Reliability/Unbiased Medium There is no indication that the methodology for producing the intowards a particular product or outcome.	roduct or outcome.
(Method Objectivity) towards a particular product or outcome.	roduct or outcome.
Metric 4: Reliability/Analytical Method N/A Rating of this factor is not applicable to this kind of information	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	not applicable to this kind of information.
Metric 6: Models N/A Rating of this factor is not applicable to this kind of information	not applicable to this kind of information.

Study Citation:
OECD Harmonized
Template:

Physical Form or State

HERO ID:

3827307

Parameter	Data
CASRN and Test Material	77536-66-4; Actinolite
Confidentiality, Type, and Guideline	None; Experimental; Not reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	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 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	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 Qua	lity Determ	ination	High	

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:

Parameter

HERO ID: 3827307

EXTRACTION

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 spinnable

Data

			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	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	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	
Template:	

Domain 3: Other

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

Physical Form or State

Metric 5:

Databases

	Physical Form o	or State		
Template:	2027207			
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-67-5; Anthophyllite		
Confidentiality, Type, and Gu	ideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage, a	and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and	l 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 Reliability	T.			
- -	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.

Metric 6:	Models	N/A Rating of this factor is not applicable to this kind of information.	
Overall Quality Determi	nation	High	

N/A

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

Study Citation:	
OECD Harmonized	
Template:	

Physical Form or State

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3827307			
		EXTRACTIO	N
	Data		
al	77536-66-4; Actinolite		
d Guideline	None; Experimental; Not reported		
age, and Stability	NR; NR; NR; NR		
e, and Purity	NR; NR; NR; NR		
	Spinnability: poor		
		EVALUATIO:	N
	Metric	Rating	Comments
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.
oility			
•	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	<u> </u>	2/10/01/01/11	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.
	3827307 al Guideline age, and Stability and Purity Metric 1: Metric 2: billity Metric 3:	Data T7536-66-4; Actinolite Guideline None; Experimental; Not reported NR; NR; NR; NR NR; NR; NR NR; NR; NR Spinnability: poor Metric Metric 1: Representativeness Metric 2: Appropriateness Metric 3: Reliability/Unbiased (Method Objectivity)	3827307 Data T7536-66-4; Actinolite Guideline Ige, and Stability In NR; NR; NR; NR Ige, and Purity In Metric Metric Representativeness Metric 2: Appropriateness Metric 3: Reliability/Unbiased (Method Objectivity) EXTRACTIO EXTRACTIO EXTRACTIO THE ACTIO TO T

	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.
Overall Quality Determination			High	

Study Citation: OECD Harmonized Template:

Parameter

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

DECD Harmonized Physical Form or State

HERO ID: 3827307

EXTRACTION

CASRN and Test Material 77536-68-6; Tremolite

Confidentiality, Type, and Guideline

Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity

None; Experimental; Not reported
NR; NR; NR; NR
NR; NR; NR
NR; NR; NR

Results Details Flexibility: generally brittle, sometimes flexible

Data

			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	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	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 Quali	ity Determ	ination	High	

Study Citation:	
OECD Harmonized	
Template:	

ECD Harmonized Physical Form or State

HERO ID:

Parameter

Results Details

3827307

EXTRACTION

CASRN and Test Material
Confidentiality, Type, and Guideline
Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity

77536-67-5; Anthophyllite None; Experimental; Not reported

NR; NR; NR; NR NR; NR; NR; NR

Data

Flexibility: very brittle, non-flexible

			EVALUATIO1	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 (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.

Study Citation:	
OECD Harmonized	
Template:	

HERO ID:

Parameter

Physical Form or State

HERO ID:	3827307

EXTRA	CTION	

CASRN and Test Material 77536-66-4; Actinolite None; Experimental; Not reported

Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity

NR; NR; NR; NR NR; NR; NR; NR

Data

Results Details

Flexibility: brittle and non-flexible

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	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	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.	
Orranall Orrali	24 Do40	: a4: a	II!~L		
Overall Quali	ity Determ	ination	High		

Study Citation:
OECD Harmonized
Template:

CD Harmonized Physical Form or State

Template: HERO ID:

3827307

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Parameter	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; NR
Results Details	Resistance to acids: fair; Resistance to bases: good; wt. % loss after 2 hr reflux with 25% acid or base: 4.77% (HCl), 1.99% (CH3COOH), 4.99% (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% (CH3COOH),

4.89% (H3PO4), 4.74% (H2SO4), 1.65% (NaOH)

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. (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: N/A Rating of this factor is not applicable to this kind of information. Databases 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
Template:

OECD Harmonized	Physical Form	or State	1 1	
Template: HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Materia	ıl	77536-67-5; Anthophyllite		
Confidentiality, Type, and	d Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Stora	ge, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, 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% (CH3CO 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% (HCl), (CH3COOH), 3.29% (H3PO4), 2.90% (H2SO4), 1.77% (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	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	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 Quality Determination High

Study Citation:
OECD Harmonized
Template:

Physical Form or State

Template: HERO ID:

Parameter

3827307

	EXTRACTION
Data	

CASRN and Test Material

77536-66-4; Actinolite

Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability None; Experimental; Not reported

Radiolabel, Source, State, and Purity

NR; NR; NR; NR 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% (CH3COOH), 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% (HCl), 12.14%

(CH3COOH), 20.10% (H3PO4), 20.60% (H2SO4), 9.43% (NaOH)

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	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	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	
Template:	

DECD Harmonized Physical Form or State

HERO ID:

Parameter

3827307

EXTRACTIO	N
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CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline None; Experimental; Not reported

Data

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity NR; NR; NR; NR

Results Details Color: White, gray, green, yellowish

			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	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	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
Template:

Physical Form or State

HERO ID:

Parameter

3827307

EXTRACTION

CASRN and Test Material 12172-73-5; Amosite Confidentiality, Type, and Guideline

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity

Results Details

None; Experimental; Not reported

NR; NR; NR; NR

Data

Color: Ash gray, greenish, 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 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	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 Quali	ity Determi	ination	High	

Study Citation:
OECD Harmonized
Template:

Physical Form or State

HERO ID:

Parameter

Results Details

3827307

CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity 12001-28-4; Crocidolite

None; Experimental; Not reported

NR; NR; NR; NR NR; NR; NR; NR

Data

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 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	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 Quali	ty Determ	ination	High	

Study Citation:
OECD Harmonized
Template:

Physical Form or State

Template: HERO ID:

Parameter

3827307

EXTRACTION

CASRN and Test Material	12001-29-5; Chrysotile
Confidentiality, Type, and Guideline	None; Experimental; Not reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR

Radiolabel, Source, State, and Purity

Results Details

NR; NR; NR; NR Texture: silky, soft to harsh

Data

			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	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	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 Quali	ity Determ	ination	High	

Study Citation:
OECD Harmonized
Template:

monized Physical Form or State

Template: HERO ID:

Parameter

3827307

EXTRACTION

CASRN and Test Material 12172-73-5; Amosite

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 NR; NR; NR

Results Details Texture: coarse, but somewhat pliable

Data

			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	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 Qual	ity Determ	ination	High	

Study Citation:	
OECD Harmonized	
Template:	

Parameter

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
Data	

CASRN and Test Material 12001-28-4; Crocidolite Confidentiality, Type, and Guideline

Solvent, Reactivity, Storage, and Stability

Radiolabel, Source, State, and Purity Results Details

None; Experimental; Not reported

NR; NR; NR; NR NR; NR; NR; NR Texture: soft to 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 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	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	
Template:	

ECD Harmonized Physical Form or State

Template: HERO ID:

3827307

		EXTRACTION
Parameter	Data	

CASRN and Test Material 12172-73-5; Amosite

Confidentiality, Type, and Guideline None; Experimental; Not reported

Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity
Results Details
NR; NR; NR
Spinnability: fair

			EVALUATIO1	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	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	
Template:	

DECD Harmonized Physical Form or State

Template: HERO ID:

3827307

		EXTRACTION
Parameter	Data	

CASRN and Test Material 12001-29-5; Chrysotile
Confidentiality, Type, and Guideline None; Experimental; Not reported

Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity

NR; NR; NR; NR NR; NR; NR; NR

Radiolabel, Source, State, and Purity Results Details NR; NR; NR; NR 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 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	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	
Template:	

Physical Form or State

HERO ID:	3827307			
	3021301	D.	EXTRACTIO	ON .
Parameter		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR		
Results Details		Spinnability: fair		
			EVALUATIO	on and the state of the state o
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		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
	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.
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
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Study Citation:	
OECD Harmonized	
Template:	

Physical Form or State

HERO ID: 3827307

EXTRACTION

Parameter	Data
CASRN and Test Material	12001-29-5; Chrysotile
Confidentiality, Type, and Guideline	None; Experimental; Not reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	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 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	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 Quality Determination High				

Study Citation: OECD Harmonized					
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, and Stability		NR; NR; NR			
Radiolabel, Source, State, and Purity		NR; NR; Solid; NR			
Results Details	,	6 values were reported in Reaxys - Colo	or: Green (1), white	(3), yellowish green (1), yellowish white (1).	
		6 values were reported in Reaxys - Colo	EVALUATIO		
		6 values were reported in Reaxys - Colo			
Results Details			EVALUATIO	N .	
Results Details Domain	Metric 1:		EVALUATIO	N .	

Overall Quality Detern	nination	High	
Metric 6:	Models	N/A Rating of this factor is not applicable to this kind of informa	tion.
		use OR includes references to the original sources.	-

Reliability/Unbiased

(Method Objectivity)

Databases

Reliability/Analytical Method

Metric 3:

Metric 4:

Metric 5:

Domain 3: Other

Medium

N/A

High

There is no indication that the methodology for producing the information was biased

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

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

towards a particular product or outcome.

^{*} 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

OECD Harmonized Template:	Physical Form			
HERO ID:	7924812			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		17068-78-9; Anthophyllite		
Confidentiality, Type, and		None; Experimental; Not reported		
Solvent, Reactivity, Storage, and Stability		NR; NR; NR		
Radiolabel, Source, State, and Purity		NR; NR; Solid; NR		
Results Details	·	3 values reported in Reaxys - Color: Lig	ght brown, pale gree	en, and white.
			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	Medium	There is no indication that the methodology for producing the information was biased
		(Method Objectivity)		towards a particular product or outcome

Overall Quality Determination High

Databases

Models

Reliability/Analytical Method

Metric 4:

Metric 5:

Metric 6:

Domain 3: Other

N/A

High

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.

use OR includes references to the original sources.

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: 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:	Larrañaga, M. D., Lewis, R. J., Lewis, R. A. (2016). Hawley's condensed chemical dictionary. :57, 58, 1232.
OECD Harmonized	Physical Form 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, and Stability	NR; NR; NR
Radiolabel, Source, State, 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 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	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 Qual	ity Determ	ination	High		

^{*} Related References: HEROID: 8001410

Larrañaga, M. D., Lewis, R. J., Lewis, R. A. (2016). Hawley's condensed chemical dictionary. :57, 58, 1232.

OECD Harmonized

Physical Form or State

Template: HERO ID:

Parameter

5333260

EXTRACTION

CASRN and Test Material 1332-21-4; Asbestos

Confidentiality, Type, and Guideline None; Experimental; Not reported

Data

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity NR; NR; NR; NR NR; NR

Results Details Spinnability: Possible with longer fibers (serpentine asbestos); 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 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	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 Qua	lity Determ	ination	High	

^{*} Related References: HEROID: 8001410

Study Citation:

Larrañaga, M. D., Lewis, R. J., Lewis, R. A. (2016). Hawley's condensed chemical dictionary. :57, 58, 1232.

OECD Harmonized

ized Physical Form 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, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity NR; NR; NR; NR NR; NR; NR

Results Details Composition: magnesium silicate (serpentine); magnesium, iron, calcium, and sodium silicates (amphibole)

			EVALUATION	V
Domain		Metric	Rating	Comments
Domain 1: Substance				
M	letric 1:	Representativeness	High	Data are measured for the subject chemical substance.
M	letric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliability				
M	letric 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.
M	Ietric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
Domain 3: Other				
M	Ietric 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.
M	letric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
M Overall Quality I			N/A High	Rating of this factor is not applicable to this kind of information.

^{*} Related References: HEROID: 8001410

Larrañaga, M. D., Lewis, R. J., Lewis, R. A. (2016). Hawley's condensed chemical dictionary. :57, 58, 1232.

Template:

Parameter

Physical Form or State

HERO ID: 5333260

EXTRACTION

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 Radiolabel, Source, State, and Purity NR; NR; Solid; NR

Results Details Composition: magnesium and iron silicates.

Data

	EVALUATIO	N
Metric	Rating	Comments
Representativeness	High	Data are measured for the subject chemical substance.
Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
(Method Objectivity)		towards a particular product or outcome.
Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
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.
Models	N/A	Rating of this factor is not applicable to this kind of information.
ination	High	
	Representativeness Appropriateness Reliability/Unbiased (Method Objectivity) Reliability/Analytical Method Databases	Representativeness High N/A Reliability/Unbiased Medium (Method Objectivity) Reliability/Analytical Method N/A Databases High Models N/A

^{*} Related References: HEROID: 8001216

Study Citation:
OECD Harmonized

Template:

Physical Form or State

HERO ID:

5333260

EXTRACTION

Parameter	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	Mohs hardness: 5 to 6
Results Details	Mohs hardness: 5 to 6

			EVALUATIO		
Domain		Metric	Rating	Comments	
Domain 1: Substance	2				
	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	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	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 Qua	lity Determ	ination	High		

^{*} Related References: HEROID: 8001314

Study Citation:
OECD Harmonized

Template:

Physical Form or State

HERO ID:

5333260

EXTRACTION

Parameter	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	Color: white to light-green	

EVALUATION					
Domain		Metric	Rating	Comments	
Domain 1: Substance	2				
	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	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	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 Qua	lity Determ	ination	High		

^{*} Related References: HEROID: 8001314

Study Citation:
OECD Harmonized

Template:

Parameter

Results Details

Physical Form or State

Data

Luster: vitreous to silky

HERO ID: 5333260

EXTRACTION

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; Solid; NR

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 (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.

N/A

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

Overall Quality Determination High

Models

Metric 6:

^{*} Related References: HEROID: 8001314

Study Citation:
OECD Harmonized

OECD Harmonized Template:

Physical Form or State

HERO ID: 5333260

EXTRACTION

Parameter	Data	
CASRN and Test Material	77536-66-4; Actinolite	
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	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 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	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 Qua	Overall Quality Determination High				

^{*} Related References: HEROID: 8001001

Study Citation:		NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.					
OECD Harmonized	Physical Form	Physical Form or State					
Template: HERO ID:	7924733						
HERO ID:	1924133						
			EXTRACTIO	N			
Parameter		Data					
CASRN and Test Materia	1	12001-29-5; Chrysotile					
Confidentiality, Type, and		None; Experimental; Not reported					
Solvent, Reactivity, Storag		NR; NR; NR					
Radiolabel, Source, State,		NR; NR; Solid; NR					
Results Details	Ž	Color: usually white to grayish green, may have tan coloring					
			•				
			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	ility						
	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.			

High

Overall Quality Determination

^{*} 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:

NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

OECD Harmonized

Radiolabel, Source, State, and Purity

Physical Form or State

Template: HERO ID:

Results Details

7924733

EXTR	11	TT	Ω	J
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Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile
Confidentiality, Type, and Guideline None; Experimental; Not reported
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

NR; NR; Solid; NR
Unit fiber average diameter: 0.025 μm. Fiber aggregate diameters: 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 Reliab	ility			
	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 Quali	ity Determ	ination	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

NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

OECD Harmonized

Physical Form or State

Template:

Parameter

HERO ID: 7924733

EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline None; Experimental; Not reported

Data

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR; NR Radiolabel, Source, State, and Purity NR; NR; Solid; NR

Results Details Composition: Silica sheet (Si2O5), with a layer of brucite (Mg(OH)2) with every 3 hydroxyls replaced by oxygens.

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	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 Quali	Overall Quality Determination 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)

NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

Physical Form or State

Template: HERO ID:

Parameter

7924733

EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile

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

Results Details Individual fiber diameter: 0.02 - 0.03 µm

Data

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	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 Quality Determination			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)

NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

OECD Harmonized

nized Physical Form or State

Template:

HERO ID: 7924733

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline None; Experimental; Not reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR; NR Radiolabel, Source, State, and Purity NR; NR; Solid; NR

Results Details Average fiber outer diameter: 200 A

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 Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	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 Qual	lity Determ	ination	High	

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

NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

Template:

Physical Form or State

HERO ID:

Parameter

7924733

EXTRACTION

CASRN and Test Material

12001-29-5; Chrysotile Confidentiality, Type, and Guideline None; Experimental; Not reported

Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity

NR; NR; NR; NR NR; NR; Solid; NR

Data

Results Details Luster: silky

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	ility				
	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.	
0 110 11		•			
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

NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

Physical Form or State

Template:

Parameter

HERO ID: 7924733

EXTRACTION			
	FXTR	ΔCT	ION

CASRN and Test Material	12001-29-5: Chrysotile

Confidentiality, Type, and Guideline

None; Experimental; Not reported

Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity

NR; NR; NR; NR NR; NR; Solid; NR

Data

Results Details

Hardness (Mohs): 2.5 - 4.0

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	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 Qual	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

NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

Physical Form or State

Template:

Parameter

HERO ID: 7924733

EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile 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

Results Details Optical properties: biaxial positive parallel extinction

Data

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	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 Quali	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

Study Citation: OECD Harmonized NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

Template:

Physical Form or State

Template: HERO ID:

Parameter

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EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile
Confidentiality, Type, and Guideline None; Experimental; Not reported
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity

NR; NR; Solid; NR Flexibility: high

Data

Results Details

	EVALUATION				
Domain	omain 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	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 Quali	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

Study Citation: OECD Harmonized NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

OECD Harmonized Template:

Physical Form or State

Template: HERO ID:

Parameter

ID: 7924733

EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline None; Experimental; Not reported

Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity Results Details

NR; NR; NR; NR NR; NR; Solid; NR Texture: silky, soft to harsh

Data

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 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 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

Study Citation:
OECD Harmonize

NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5.

OECD Harmonized Template:

Physical Form or State

Template: HERO ID:

Parameter

7924733

EXTR	ACTI	ON

CASRN and Test Material	12001-29-5; Chrysotile
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

Data

Results Details Tensile strength: 1100 - 4400 Mpa

EVALUATION					
Domain	in 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.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Quali	ty Determ	ination	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: 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.

OECD Harmonized

Physical Form or State

Data

Template:

Parameter

HERO ID: 3581598

EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile

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 Surface area: 16.2 m²/g at 600°C to 45.2 m²/g at 700°C and back down to 2 m²/g at 1100°C calcination temperature.

			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	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 Relia	ability			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.
	Metric 4:	Reliability/Analytical Method	Medium	Analytic 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.

Overall Quality Determination Medium

Study Citation: OECD Harmonized Template:	ATSDR, (2001) Melting Point). Toxicological profile for asbestos (Upd	ate, September 20	001).
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Melting Point		600 - 900 °C		
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods		not specified		
Standard Deviation Results	S	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	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	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.

Study Citation: OECD Harmonized	ATSDR, (2001) Melting Point). Toxicological profile for asbestos (Upd	late, September 2	001).
Template:				
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
Melting Point		800 - 850 °C		
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		
Radiolabel, Source, State, and Purity		NR; NR; NR; NR Notes: NR		
Results Details Methods		not specified		
Standard Deviation Results	S	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	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.

Overall Quality Determination High

Models

Metric 6:

N/A

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

Study Citation:	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).
OECD Harmonized	Melting Point
Template:	
HERO ID:	786664

HERO ID: /80004					
EXTRACTION					
Parameter	Data				
Malting Daint	800 - °C				
Melting Point CASRN and Test Material	12001-28-4; crocidolite				
Confidentiality, Type, and Guideline	none; not specified; not specified				
Solvent, Reactivity, Storage, and Stability	NR; NR; NR				
Radiolabel, Source, State, and Purity	NR; NR; NR; NR Notes: NR				
Results Details Methods	not specified				
Standard Deviation Results	not specified				
Results Details	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 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	Low	The analytical method is unknown and there is no indication that a reliable method was		

	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 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	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.

Study Citation:	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).
OECD Harmonized	Melting Point
Template:	
HERO ID:	786664

	EXTRACTION
Parameter	Data
Melting Point	1040 - °C
CASRN and Test Material	14567-73-8; tremolite
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	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 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	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 Determ	ination	High	

Overall Quality Determination	High	
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Study Citation:		. Toxicological profile for asbestos (Up	date, September 2	001).
OECD Harmonized	Melting Point			
Template:				
HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data		
		0.50		
Melting Point		950 - °C		
CASRN and Test Material		17068-78-9; anthophyllite		
Confidentiality, Type, and	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods		not specified		
Standard Deviation Result	is	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 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	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 Qual	lity Determ	ination	High	

Study Citation:		ce of Environmental Health Hazard Asser and cancer potency values.	ssment (OEHHA	(2011). Appendix B: Chemical-specific summaries of the information used to
OECD Harmonized	Melting Point	and cancer potency varieties.		
Template:				
HERO ID:	5155632			
			EXTRACTIO	N
Parameter		Data		
Melting Point		600 °C		
CASRN and Test Material		1332-21-4; Asbestos		
Confidentiality, Type, and C	Guideline	none; not specified; NR		
Solvent, Reactivity, Storage		NR; NR; NR		
Radiolabel, Source, State, a	-	NR; NR; NR Notes: decomposes at	600°C	
Results Details Methods		NR		
Standard Deviation Results		NR		
Results Details		Not Reported		
D		Matria	EVALUATIO	
Domain		Metric	Rating	Comments
Domain 1: Substance	Metric 1:	Representativeness	Uiah	Data are measured or estimated for the subject chemical substance.
	Metric 2:	Appropriateness	High High	Measured data are consistent with the subject chemical substance structural features.
	Wietric 2.	Appropriatelless	Ingii	iveasured data are consistent with the subject element substance structural readures.
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 3. 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	v Determi	nation	High	

HERO ID: 5155632 Table: 1 of 1

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

Study Citation: OECD Harmonized Template:	Cameo Chemic Melting Point	als, (2016). Chemical datasheet: asbest	os.	
HERO ID:	3981007			
			EXTRACTIO	N
Parameter		Data		
Melting Point		1112 F		
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		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods		NR		
Standard Deviation Results	s	NR		
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	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 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 Quali	tv Determi	nation	High	

^{*} Related References: NIOSH, 2016 cited but no other details available

Study Citation: OECD Harmonized	Cameo Chemic Melting Point	als, (2016). Chemical datasheet: asbest	os (blue).	
Template: HERO ID:	3981008			
			EXTRACTIO	N
Parameter		Data		
Melting Point		1112 - F		
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,		NR; NR; NR; NR Notes: NR		
Results Details Methods		Not reported		
Standard Deviation Result	s	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 or behaviors.
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 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 Quali	tv Determi	nation	High	
Cician Quan	y Determin	IIMUVII	111811	

^{*} Related References: NIOSH, 2016 cited but no other details available

Study Citation:	Candela P.A. Crummett C.D. Farnest D.I. Frank M.R.	Wylie, A. G. (2007). Low-pressure decomposition of chrysotile as a function of time and
Study Citation.	Canacia, 1. 71., Crammett, C. D., Earnest, D. J., I fank, W. K	, wyne, 11. G. (2007). Bow pressure decomposition of emysothe as a function of time and

temperature. American Mineralogist 92(10):1704-1713. Melting Point

OECD Harmonized

Template: HERO ID:

3582618

		EXTRACTIO	ON CONTRACTOR OF THE PROPERTY
Parameter	Data		
Melting Point	Not Reported		
CASRN and Test Material	12001-29-5; Chrysotile		
Confidentiality, Type, and Guideline	None; Experimental; NR		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and Purity	NA; Thetford, Quebec, Canada; Jeffrey MR; 96%; 96%; NR Notes: 4 different sa		uebec, Canada; New Idria, California; Jeffrey Mine, Asbestos, Quebec, Canada; Solid;
Results Details Methods	Performed in Lindberg box-type quench	furnace.	
Standard Deviation Results	Not Reported		
Results Details	, .		recrystallization observed between 450 and 550°C. Complete destruction was observed struction was not observed after heating to 475°C for 30 days. Above 800°C, destruction
		EVALUATIO	N
Domain	Metric	EVALUATIO Rating	Comments
	Metric		
Domain Domain 1: Substance Metric 1:	Metric Representativeness		
Domain 1: Substance		Rating	Comments
Domain 1: Substance Metric 1: Metric 2:	Representativeness	Rating High	Comments Data are measured or estimated for the subject chemical substance.
Domain 1: Substance Metric 1:	Representativeness Appropriateness Reliability/Unbiased	Rating High	Comments Data are measured or estimated for the subject chemical substance.
Domain 1: Substance Metric 1: Metric 2: Domain 2: Test Reliability	Representativeness Appropriateness	Rating High High	Comments Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features. The methodology for producing the information is designed to answer a specific ques-
Domain 1: Substance Metric 1: Metric 2: Domain 2: Test Reliability Metric 3:	Representativeness Appropriateness Reliability/Unbiased (Method Objectivity)	Rating High High High	Comments Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features. The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear. Data are obtained by accepted standard analytical methods, including, but not limited to
Domain 1: Substance Metric 1: Metric 2: Domain 2: Test Reliability Metric 3: Metric 4:	Representativeness Appropriateness Reliability/Unbiased (Method Objectivity)	Rating High High High	Comments Data are measured or estimated for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features. The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear. Data are obtained by accepted standard analytical methods, including, but not limited to

Study Citation: OECD Harmonized	EC, (2012). Pra Melting Point	actical guidelines for the information an	d training of workers in	volved with asbestos removal or maintenance work.
Template:				
HERO ID:	3981018			
			EXTRACTION	
Parameter		Data		
Melting Point		> 1200 - °C		
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 Details Methods		NR		
Standard Deviation Results	3	NR		
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			
	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.

Medium

Overall Quality Determination

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		
M.R. D.		000 050 00		
Melting Point CASRN and Test Material		800 - 850 °C		
	Suit dusting	12001-29-5; Chrysotile		
Confidentiality, Type, and Guideline		None; Experimental; NR NR; NR; NR; NR		
Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity		NR; NR; NR; NR NR; Not Reported; NR; NR Notes: white	a ac h actas	
Results Details Methods	nu i unty	NR; Not Reported; NR; NR Notes: Willia	asuesius	
Standard Deviation Results		NR		
Results Details		NR		
results Betains				
			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	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	v 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).

Study Citation: OECD Harmonized		ECHA scientific report for evaluation of	limit values for a	asbestos at the workplace.
Template:	Melting Point			
HERO ID:	9109807			
IIEKO ID:	7107007		EXTEN A CONTO	A.,
Parameter		Data	EXTRACTIO	N
rarameter		Data		
Melting Point		600 - 900 °C		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and Guideline None; Experimental; NR				
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR				
Radiolabel, Source, State, a	-	NR; Not Reported; NR; NR Notes: brow	n asbestos	
Results Details Methods	-	NR		
Standard Deviation Results	S	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 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	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: 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).

Study Citation: OECD Harmonized	ECHA, (2021). Melting Point	ECHA scientific report for evaluation of	limit values for a	asbestos at the workplace.
Template:	Wiching I offic			
HERO ID:	9109807			
			EXTRACTIO	N
Parameter		Data		
Melting Point		800 - °C		
CASRN and Test Material		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 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 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.

^{*} 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).

High

Overall Quality Determination

Template: HERO ID: Parameter	7924812			
	7924812			
Parameter				
Parameter			EXTRACTIO	N
<u> </u>		Data		
Melting Point		1150 - 1340 °C		
CASRN and Test Material		17068-78-9; Anthophyllite		
Confidentiality, Type, and G	uideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage.		NR; NR; NR		
Radiolabel, Source, State, an	•	NR; NR; Solid; NR		
Results Details Methods	Ž	Not Reported		
Standard Deviation Results		Not Reported		
Results Details		1 range reported in Reaxys.		
			EVALUATIO	X 7
Domain		Metric	Rating	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	High	Measured data are consistent with the subject chemical substance structural features
		11ppropriateness		(e.g., presence of certain functional groups) and/or other physical/chemical properties.
Domain 2: Test Reliabili	tv			
2 0 21 1000 1101	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				
Zomani S. Guioi	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 Determir	nation	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

Study Citation: OECD Harmonized	Elsevier, (2021) Melting Point). Reaxys: physical-chemical property da	ta for Actinolite.	
Template:	Westing Form			
HERO ID:	7924815			
			EXTRACTIO	N
Parameter		Data		-
Melting Point		1140 - 1296 °C		
CASRN and Test Material		12172-67-7; Actinolite		
Confidentiality, Type, and C	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR		
Radiolabel, Source, State, a	nd Purity	NR; NR; Solid; NR		
Results Details Methods		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		1 range reported in Reaxys. Collected us	sing the search term	a '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	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	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 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.

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

Study Citation: OECD Harmonized	Elsevier, (2021) Melting Point). Reaxys: physical-chemical property data	ta for Richterite.	
Template: 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	Reaxys.	
			EVALUATIO	N 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 (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 Determi	nation	High	

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

		_		CaCl2 addition effect and melt formation in low-temperature decomposition of			
OECD Harmonized	chrysotile with Melting Point	CaCO3. Ceramic Society of Japan. Journ	nal 114(1334):84	4-848.			
Template:	Mennig Folia						
HERO ID:	3581958						
			EXTRACTIO	N			
Parameter		Data					
Melting Point		> 700 - 1000 °C					
CASRN and Test Material		12001-29-5; Chyrsotile					
Confidentiality, Type, and C	Guideline	None; experimental; None					
Solvent, Reactivity, Storage, and Stability		NR; Yes; NR; decomposition to forsterite	e and amorphous S	5iO2 at 800°C			
Radiolabel, Source, State, a	-	NR; Kanto Chemical Co., Inc.; Solid; Re	eported as 1st grade	e Notes: 1:6 mixtures of chrysotile (Mg6Si4O10(OH)8) and CaCO3 burned at temper-			
D14- D-4-11- M-41-1		atures of 500 to 1000°C	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 without the formation of melts, observed at 700°C when trace CaCl2 was present; material heated at temperatures for 2 hours				
Standard Deviation Results		not reported					
Results Details		Decomposition temperature decreases when asbestos test substance was mixed with CaCO3; addition of CaCl2 further lowers dec temperature.					
			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			
		(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							
Johan J. Oulei	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.			
		Models	N/A	Rating of this factor is not applicable to this kind of information.			

Study Citation:							
OECD Harmonized	Goncharov, Y. Melting Point	I., Kholodova, N. A., Sergeev, N. E. (1990)	. Amphibole-based	thermal-insulating ceramics. Glass and Ceramics 47(7-8):267-270.			
Template: HERO ID:	7473172						
			EXTRACTION				
Parameter		Data					
Melting Point		> 600 - °C					
CASRN and Test Material		12001-29-5; Chrysotile					
Confidentiality, Type, and Guideline		None; experimental; High temperature hea	ating and analysis by a	n x-ray diffraction method			
Solvent, Reactivity, Storage, and Stability		NA; yes; NR; decomposition					
Radiolabel, Source, State, and Purity		NR; NR; Solid; NR Notes: heated with other components as part of ceramic material investigation					
Results Details Methods		formation of Na-richterite at 800 deg C					
Standard Deviation Results		NR					
Results Details Na-richterite formed by firing process at 500-1150 deg C range with magnesium oxide, quartz sand, sodium fluoride				with magnesium axide, quartz sand, sodium fluoride			
Results Details		The frence to fined by firing process at 5	oo 1150 deg e tange v	with magnesium oxide, quartz sand, soutum nuoride			
Results Details		The Helicitic formed by hims process at 5	oo 1130 deg e fange v	with magnesium oxide, quartz sand, sourum nuoride			
		, c.	EVALUATION				
Domain				Comments			
		Metric	EVALUATION Rating	Comments			
Domain	Metric 1:	Metric Representativeness	EVALUATION Rating Medium	Comments Data are measured or estimated for the subject chemical substance as part of a mixture.			
Domain	Metric 1: Metric 2:	Metric	EVALUATION Rating	Comments			
Domain Domain 1: Substance	Metric 2:	Metric Representativeness	EVALUATION Rating Medium	Comments Data are measured or estimated for the subject chemical substance as part of a mixture.			
Domain	Metric 2:	Metric Representativeness Appropriateness	EVALUATION Rating Medium N/A	Comments Data are measured or estimated for the subject chemical substance as part of a mixture. Rating of this factor is not applicable to this kind of information.			
Domain Domain 1: Substance	Metric 2:	Metric Representativeness Appropriateness Reliability/Unbiased	EVALUATION Rating Medium	Comments Data are measured or estimated for the subject chemical substance as part of a mixture. Rating of this factor is not applicable to this kind of information. There is no indication that the methodology for producing the information was biased			
Domain Domain 1: Substance	Metric 2: ility Metric 3:	Metric Representativeness Appropriateness Reliability/Unbiased (Method Objectivity)	EVALUATION Rating Medium N/A Medium	Comments Data are measured or estimated for the subject chemical substance as part of a mixture. Rating of this factor is not applicable to this kind of information. There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
Domain Domain 1: Substance	Metric 2:	Metric Representativeness Appropriateness Reliability/Unbiased	EVALUATION Rating Medium N/A	Comments Data are measured or estimated for the subject chemical substance as part of a mixture. Rating of this factor is not applicable to this kind of information. There is no indication that the methodology for producing the information was biased			
Domain Domain 1: Substance	Metric 2: ility Metric 3:	Metric Representativeness Appropriateness Reliability/Unbiased (Method Objectivity)	EVALUATION Rating Medium N/A Medium	Comments Data are measured or estimated for the subject chemical substance as part of a mixture. Rating of this factor is not applicable to this kind of information. There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
Domain Domain 1: Substance Domain 2: Test Reliab	Metric 2: ility Metric 3:	Metric Representativeness Appropriateness Reliability/Unbiased (Method Objectivity)	EVALUATION Rating Medium N/A Medium	Comments Data are measured or estimated for the subject chemical substance as part of a mixture. Rating of this factor is not applicable to this kind of information. There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			

Medium

Overall Quality Determination

Study Citation:	IARC, (2012). anthophyllite).	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		600 - 900 °C		
CASRN and Test Material		12127-73-5; amosite		
Confidentiality, Type, and		None; not specified; None		
Solvent, Reactivity, Storage	•	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	None; NR; solid; NR		
Results Details Methods		decomposition temperature		
Standard Deviation Results	3	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 Reliabil	litv			
	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 Quali	ty Determi	nation	High	

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		RC Monographs on the evaluation of c	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, an
OECD Harmonized	anthophyllite). Melting Point			
Template:				
HERO ID:	3970851			
			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; 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	S	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 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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of o	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		400 - 900 °C		
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 Details Methods		decomposition temperature		
Standard Deviation Results	S	Not Reported		
Results Details		Not Reported		
			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance			8	
	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	•			
	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	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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:	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		950 - 1040 °C		
CASRN and Test Material		77536-68-6; tremolite		
Confidentiality, Type, and C	Guideline	None; not specified; NR		
Solvent, Reactivity, Storage		NR; NR; NR		
Radiolabel, Source, State, a	-	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 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.
Overall Qualit	ty Determin	nation	High	

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:	Jenkins, D. M., Holland, B., T.J., Clare, A. K. (1991). Experimental-determination of the pressure-temperature stability field and thermochemical property					
OECD Harmonized	of synthetic treat	molite. American Mineralogist 76(3-4):45	8-469.			
Template:	Wielting Foliit					
HERO ID:	3581993					
			EXTRACTIO)N		
Parameter		Data				
Melting Point		= 448 - C (decomposition temperature)				
CASRN and Test Materia	ıl	14567-73-8; synthetic tremolite (calcic ar	nphibole)			
Confidentiality, Type, and	l Guideline	none; experimental/calculation; non-guide	eline study			
Solvent, Reactivity, Storag	ge, and Stability	NA; decomposition; NA; NA				
Radiolabel, Source, State,	, and Purity	NA; prepared by authors in the laboratory	; solid; NR			
Results Details Methods		Experimental data (piston cylinder presses at 20-30 kbar, uncertainty: ±200 bar; chromel-alumel thermocouples, ±5°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		± 50 bars (accuracy in pressure measurements); $\pm 2^{\circ}$ C (accuracy of thermocouples)				
Results Details		Decomposition temperature at 1 bar = 448	°C; decomposition ide and talc at terms	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures mperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C;		
		Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops	°C; decomposition ide and talc at terms	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures mperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C;		
Results Details Domain		Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops	°C; decompositio ide and talc at ter bar.	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures mperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C;		
Results Details Domain		Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops upper-pressure stability at 798°C = 26.8 k	°C; decompositionide and tale at tenter. EVALUATIO	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures in the pressures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C;		
Results Details Domain	Metric 1:	Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops upper-pressure stability at 798°C = 26.8 k	°C; decompositionide and tale at tenter. EVALUATIO	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures imperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C; Comments Data are measured for the subject chemical substance.		
Results Details Domain		Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops upper-pressure stability at 798°C = 26.8 k Metric	°C; decompositio ide and talc at ter tbar. EVALUATIO Rating	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures imperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C; N Comments		
Domain Domain 1: Substance	Metric 1: Metric 2:	Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops upper-pressure stability at 798°C = 26.8 k Metric Representativeness	°C; decomposition ide and talc at tente that. EVALUATIO Rating High	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures imperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C; Comments Data are measured for the subject chemical substance.		
Results Details	Metric 1: Metric 2:	Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops upper-pressure stability at 798°C = 26.8 k Metric Representativeness	°C; decomposition ide and talc at tente that. EVALUATIO Rating High	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures imperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C; Comments Data are measured for the subject chemical substance.		
Domain Domain 1: Substance	Metric 1: Metric 2:	Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops upper-pressure stability at 798°C = 26.8 k Metric Representativeness Appropriateness Reliability/Unbiased	°C; decomposition ide and talc at tente thar. EVALUATIO Rating High High	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures imperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C; Comments Data are measured for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features. The methodology for producing the information is designed to answer a specific ques-		
Domain Domain 1: Substance Domain 2: Test Reliabi	Metric 1: Metric 2: ility Metric 3:	Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops upper-pressure stability at 798°C = 26.8 k Metric Representativeness Appropriateness Reliability/Unbiased (Method Objectivity)	°C; decomposition ide and talc at tente thar. EVALUATIO Rating High High High	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures imperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C; Comments Data are measured for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features. The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.		
Domain Domain 1: Substance	Metric 1: Metric 2: ility Metric 3:	Decomposition temperature at 1 bar = 448 of 1.5-7 bar, and decomposition to diops upper-pressure stability at 798°C = 26.8 k Metric Representativeness Appropriateness Reliability/Unbiased (Method Objectivity)	°C; decomposition ide and talc at tente thar. EVALUATIO Rating High High High	n to diopsidic clinopyroxene, enstatic orthopyroxene, beta-quartz, and water at pressures imperatures of 650-760°C were reported. Upper-thermal stability at 7.5 kbar = 918°C; Comments Data are measured for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features. The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.		

Study Citation:	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 120(3):1585-1595.

OECD Harmonized

Melting Point

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; Deco	omposition and de	termination of the temperature range of the crocidolite dehydroxylation process evalu-		
	ated from 0-1000°C	•			
Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity	NR; NR; NR	C41- A.C 4			
Results Details Methods Standard Deviation Results Results Details	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). thermogravimetric analysis with evolved gas analysis (TG-EGA) Not Reported 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.				
Domain	Metric	EVALUATIO Rating	N Comments		
Domain 1: Substance	Wette	Rating	Comments		
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	D 1: 1:1: //II 1: 1	TT: 1			
Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.		
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.		
Overall Quality Determi	ination	High			

Study Citation: OECD Harmonized	(2017). PubChem Melting Point	n: Chrysotile.									
Template: HERO ID:	3860485										
			EXTRACTIO	N							
Parameter		Data									
Melting Point		1112 - F									
CASRN and Test Material		12001-29-5; Not Reported									
Confidentiality, Type, and	Guideline	Not Reported; Not Reported; Not Reported	orted								
Solvent, Reactivity, Storag	e, and Stability	Not Reported; Not Reported; Not Reported	orted; Not Reported								
Radiolabel, Source, State, and Purity Results Details Methods Standard Deviation Results		Not Reported; Not Reported; Not Reported Not Reported Not Reported 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., 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 (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							

Overall Quality Determination High

Databases

Models

Metric 5:

Metric 6:

Domain 3: Other

High

N/A

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.

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

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

Study Citation:	
OFCD Harmonized	a

(2017). PubChem: Chrysotile.

Template:

Melting Point

Template:

HERO ID: 3860485

EXTRACTION

Parameter	Data
Melting Point	800 - 850 °C
CASRN and Test Material	12001-29-5; Not Reported
Confidentiality, Type, and Guideline	Not Reported; Not Reported; Not Reported
Solvent, Reactivity, Storage, and Stability	Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, and Purity	Not Reported; Not Reported; Not Reported
Results Details Methods	Not Reported
Standard Deviation Results	Not Reported
Results Details	800-850 deg C. No melting point; 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., 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.

Overall Quality Determination 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)

Study Citation: OECD Harmonized	(2017). PubChe Melting Point	em: Crocidolite.		
Template:	_			
HERO ID:	3860486			
			EXTRACTIO	N
Parameter		Data		
		4440.5		
Melting Point		1112 F		
CASRN and Test Material	G : 1 1:	12001-28-4; crocidolite		
Confidentiality, Type, and		none; experimental; NR NR; NR; NR; NR		
Solvent, Reactivity, Storag Radiolabel, Source, State,	-	NR; NR; NR; NR NR; NR; solid; NR Notes: NA		
Results Details Methods	and Furity	NR		
Standard Deviation Results	,	NR		
Results Details	,	decomposes		
regard Details		accomposes		
			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	litv			
	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 smain 3. Salei	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 OSHA Occupational Chemical DB and CAMEO Chemicals.

Study Citation: OECD Harmonized NIOSH, (2007). NIOSH pocket guide to chemical hazards.

Template:

Melting Point

HERO ID: 192177

DXZDD	ACTION	
HXIR	ACTION	

Parameter	Data
Melting Point	1112 - F
CASRN and Test Material	1332-21-4; chrysotile, crocidolite, or amosite
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 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 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	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	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.
Overall Qual	ity Determ	ination	High	

Study Citation:
OECD Harmonized

NIOSH, (2016). NIOSH pocket guide to chemical hazards: Asbestos. Melting Point

Template:

HERO ID:

3974865

Parameter	Data		
Melting Point	1112 F		
CASRN and Test Material	1332-21-4; asbestos		
Confidentiality, Type, and Guideline	Not Reported; Not Reported		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and Purity	None; NR; Solid; NR		
Results Details Methods	Not Reported		
Standard Deviation Results	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 and/or other physical/chemical 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	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 Qua	lity Determ	ination	High	

Study Citation:
OECD Harmonized

NIOSH, (2014). International chemical safety cards (ICDC): Chrysotile.

Template:

HERO ID: 3978149

EXTRACTION

Melting Point 1000 °C
CASRN and Test Material 12001-29-5; Chrysotile
Confidentiality, Type, and Guideline None; experimental; Not reported

Melting Point

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

 $Radiolabel, Source, State, and Purity \\ NR; NR; NR; NR; NR Notes: NR$

Results Details Methods Not Reported Standard Deviation Results NR

Results Details Heat resistant up to 500°C; completely decomposed at 1000°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 (e.g., presence of certain functional groups) or 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 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:
OECD Harmonized

NIOSH, (2014). International chemical safety cards (ICDC): Crocidolite.

Decomposes below 1200 deg C

Melting Point

Template:

Results Details

HERO ID: 3978150

DXZDD	ACTION	
HXIR	ACTION	

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; NR Notes: riebeckite		
Results Details Methods	NR		
Standard Deviation Results	NR		

		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 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		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 O	uality Determinati	on Hi	$\boldsymbol{\sigma}$
O totall O			-

Study Citation: OECD Harmonized	NIOSH, (2019) Melting Point). NIOSH pocket guide to chemical hazard	ds: Asbestos.	
Template: HERO ID:	9109830			
			EXTRACTIO	N
Parameter		Data		
Melting Point		= 1112 F		
CASRN and Test Material		1332-21-4; Actinolite, Actinolite asbesto Tremolite, Tremolite asbestos	os, Amosite (cumn	ningtonite-grunerite), Anthophyllite, Anthophyllite asbestos, Chrysotile, Crocidolite (Riebeckite)
Confidentiality, Type, and	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: Hydrated mine	ral silicates	
Results Details Methods		not specified		
Standard Deviation Results	3	not specified		
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.
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 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 Quali	ty Determi	ination	High	

^{*} Related References: Primary reference not reported in this secondary source.

Study Citation: OECD Harmonized	NLM, (2021). P Melting Point	PubChem: Hazardous Substance Data Ba	ink: Chrysotile, 1	2001-29-5.
Template:				
HERO ID:	7924733			
			EXTRACTIO	N
Parameter		Data		
Maria Dire		000 050 05		
Melting Point		800 - 850 °C		
CASRN and Test Material	G : 1 1:	12001-29-5; Chrysotile		
Confidentiality, Type, and		None; Experimental; Not Reported NR; NR; NR; NR		
Solvent, Reactivity, Storage Radiolabel, Source, State, a		NR; NR; NR; NR NR; NR; Solid; NR		
Results Details Methods	and Purity	Not Reported		
Standard Deviation Results		Not Reported		
Results Details	•	Not Reported		
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 and/or other physical/chemical properties.
Domain 2: Test Reliabil	itv			
Domain 2. Test Renaon	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
	1,100110 01	(Method Objectivity)	1110010111	The medicalogy is animown, our medical ones appears animoly.
	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				
2 chian 3. Onici	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 Onelia				C TOTAL THE COLUMN TO THE COLU
Overall Qualit	ty Determin	แลนบม	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:
OECD Harmonized
Template:

OSHA, (2019). Asbestos, all forms.

Melting Point

HERO ID: 7607109

	EXTR	A	CTI	ION	
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Parameter	Data EXTRACTION
Melting Point	550 (1022) - 750 (1382) C (F)
CASRN and Test Material	1332-21-4; Asbestos
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Results Details Methods	not reported
Standard Deviation Results	not reported
Results Details	dehydroxylates at 550-750°C (1022-1382°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 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 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 Quality Determination

Medium

^{*} Related References: Primary source not specified

Study Citat	on: Poniatowska, A., Andrz	ejewska-Górecka, D., Macherzyński, B	., Kisiel, M. (2019). Thermal decon	nposition of asbestos fiber from asbestos cement wastes.
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Rocznik Ochrona Środowiska 21(2):855-867. Melting Point

OECD Harmonized

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, Storage, and Stability	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:	
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 (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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: OECD Harmonized		Asbestos: Geology, mineralogy, mining,	and uses.	
Template:	Melting Point			
HERO ID:	3975020			
			EXTRACTIO	N
Parameter		Data	EXTRACTIO	TY .
1 ar ameter		Data		
Melting Point		550 - 750 °C		
CASRN and Test Material		12001-29-5; Chrysotile		
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 Notes: NR		
Results Details Methods		Not Reported		
Standard Deviation Results	S	Not Reported		
Results Details		Decomposition by dehydroxylation of the deg C the resulting magnesium silicate re		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 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 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.
Overall Quali	4 Da4a	mation	High	

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

Study Citation:	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.
OECD Harmonized	Melting Point
Template:	

HERO ID: 3975020

	EXTRACTION
Parameter	Data
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; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Results Details Methods	Not Reported
Standard Deviation Results	Not Reported
Results Details	Residual products: Ca, Mg, and Fe pyroxenes, 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 Reliability	y			
	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	Not applicable. Rating of this factor is not applicable to this kind of information.

^{*} Related References: No citation reported.

Study Citation:	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.
OECD Harmonized	Melting Point

Template:

HERO ID: 3975020

EXTR	ACTION
1221 111	1011

Parameter	Data
Melting Point	400 - 900 °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
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Results Details Methods	Not Reported
Standard Deviation Results	Not Reported
Results Details	Residual products: Na and Fe pyroxenes, 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 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 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.

^{*} Related References: No citation reported.

Study Citation:	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.
OECD Harmonized	Melting Point

Template:

HERO ID: 3975020

EXTRACTION

Parameter	Data
Melting Point	600 - 900 °C
CASRN and Test Material	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 Notes: NR
Results Details Methods	Not Reported
Standard Deviation Results	Not Reported
Results Details	Residual products: Fe and Mg pyroxenes, magnetite, 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 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	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.
Overall Ouali	ity Determ	ination	High	

^{*} Related References: No citation reported.

Study Citation: OECD Harmonized Template:	USGS, (2002). Melting Point	Asbestos: Geology, mineralogy, mining,	, and uses.	
HERO ID:	3975020			
			EXTRACTIO	N
Parameter		Data		
Melting Point		400 - 600 °C		
CASRN and Test Material		1332-21-4; Asbestos		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storag	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 Result	S	Not Reported		
Results Details		Decomposition by dehydroxylation resu and silica.	ulting 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 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 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.
	1.104.10 6.	3.6.1.1	37/4	Tr

Metric 6:

Overall Quality Determination

Models

N/A

High

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

^{*} Related References: No citation reported.

Study Citation:
OECD Harmonized

Virta, R. L. (2011). Asbestos. :1-40.

Melting Point

Template:

HERO ID:	3827175		EVED A CETO	AT
Parameter		Data	EXTRACTIO	
Melting Point		400 - 900 °C		
CASRN and Test Material		12001-28-4; Crocidolite		
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; NR		
Results Details Methods		Not Reported		
Standard Deviation Result	s	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 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 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 Quali	tv Determi	nation	High	

Virta, R. L. (2011). Asbestos. :1-40.

Melting Point

Template: HERO ID:

3827175

HERO ID: 3827175			
		EXTRACTIO	N
Parameter	Data		
Melting Point	600 - 850 °C		
CASRN and Test Material	12001-29-5; Chrysotile		
Confidentiality, Type, and Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR		
Radiolabel, Source, State, and Purity	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 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	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 Detarms	ination	Hick	
Overall Quality Determ	เมเลนเงม	High	

Virta, R. L. (2011). Asbestos. :1-40.

Melting Point

Template: **HERO ID:**

Domain 3: Other

3827175

Metric 5:

Metric 6:

EXTRACTION

EXTRACTION						
Parameter	Data					
Melting Point	950 - 1040 °C					
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; NR Notes: CAS reported i	n paper 14567-73-	8; based on details reported in document this appear to be for the asbestiform variety			
Results Details Methods	Not Reported					
Standard Deviation Results	Not Reported	Not Reported				
Results Details	Decomposition					
		DVA I HADIO	N			
Damain	Matria	EVALUATIO				
Domain Domain 1: Substance	Metric	Rating	Comments			
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			
	11 1		(e.g., presence of certain functional groups) and/or other physical/chemical 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 product or outcome.			

N/A

N/A

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.

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 Quality Determination	High
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Databases

Models

Virta, R. L. (2011). Asbestos. :1-40. Melting Point

Template: HERO ID:

3827175

EXTRACTION

Parameter	Data			
Melting Point	600 - 900 °C			
CASRN and Test Material	12172-73-5; Amosite			
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: CAS reported in paper: Amosite [19172-73-5]			
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		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 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	•	
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.	

Virta, R. L. (2004). Asbestos. 3:288-319.

Melting Point

Template:

HERO ID: 3859385

EXTR	ACTION	

Parameter Data Melting Point 400 - 900 °C CASRN and Test Material 12001-28-4; crocidolite 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; NR Notes: NR Results Details Methods NR Standard Deviation Results NR Results Details Decomposition temperature = 400-900°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 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.	
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.	
Overall Qua	lity Determ	ination	High		

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Melting Point

Template: HERO ID:

3859385

EXT	R A	CT	M	N

Parameter	Data		
Melting Point	600 - 850 °C		
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		
Radiolabel, Source, State, and Purity	NR; NR; NR; NR Notes: NR		
Results Details Methods	NR		
Standard Deviation Results	NR		

Results Details Decomposition temperature = 600-850°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 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	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.	

Virta, R. L. (2004). Asbestos. 3:288-319. Melting Point

Template:

HERO ID:

3859385

EXT	TD.	10	ודי	$\mathbf{\Omega}$	N

Parameter	Data
Melting Point	600 - 900 °C
CASRN and Test Material	12172-73-5; amosite
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Results Details Methods	NR
Standard Deviation Results	NR
Results Details	Decomposition temperature = 600-900°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 Reliab	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.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination			High	

Study Citation:

Virta, R. L. (2004). Asbestos. 3:288-319.

Data

OECD Harmonized

Melting Point

Template: HERO ID:

Parameter

3859385

EXT	RA	CП	П	O	N

Melting Point	950 - 1040 °C
CASRN and Test Material	14567-73-8; tremolite
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; NR Notes: NR
Results Details Methods	NR

Results Details Methods NR
Standard Deviation Results NR

Results Details Decomposition temperature = 900-1040°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 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.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Determination			High	

Study Citation:		-		ni, T., Shinohara, N. (2015). Detoxification mechanism of asbestos materials
OECD Harmonized	Melting Point	reatment. Journal of Hazardous Materials ?	284(Eisevier):201-20	06.
Template:				
HERO ID:	3531606			
			EXTRACTION	
Parameter		Data		
Melting Point		Not Reported		
CASRN and Test Material		•	-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	S	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 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 Reliabil	lity			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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	ty Determi	nation	Medium	

Study Citation: OECD Harmonized	(2017). PubChem Boiling Point	: Chrysotile.		
Template:				
HERO ID:	3860485			
			EXTRACTIO	N
Parameter		Data		
Boiling Point		Not Reported		
CASRN and Test Material		12001-29-5; Not Reported		
Confidentiality, Type, and C	Guideline	Not Reported; Not Reported; Not Repo	rted	
Solvent, Reactivity, Storage		Not Reported; Not Reported; Not Repo		
Radiolabel, Source, State, a	•	Not Reported; Not Reported; Not Repo		
Standard Deviation Results	•	Not Reported	rica, rior ricported	
Results Details		Decomposes		
		-		
			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 (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	ity			
2. 100 1000	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. Onici	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: NIOSH-Pocket Guide (not a primary source); OSHA Occupational Chemical DB (not a primary source); CAMEO Chemicals (not a primary source)

Study Citation: OECD Harmonized	NIOSH, (2016) Boiling Point	NIOSH pocket guide to chemical haza	rds: Asbestos.	
Template: HERO ID:	3974865			
HERO ID.	3714003		EVTDACTIO	M.
Parameter		Data	EXTRACTIO	
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	S	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	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 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.
Overall Qualit	tv Determi	nation	High	

^{*} Related References: None cited.

Study Citation: OECD Harmonized Template:	ATSDR, (2001) Density). Toxicological profile for asbestos (Up	odate, September 20	001).
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		
Temperature		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				
	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	v Determi	nation	High	

Study Citation:	ATSDR, (2001)). Toxicological profile for asbestos (Upo	date, September 2	2001).
OECD Harmonized	Density			
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, and Stability		NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR		
Density Type		specific gravity		
System		not specified		
Temperature		not specified		
Standard Deviation Result	S	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 Relia	bility Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	Wietite 3.	(Method Objectivity)	Wiedium	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		

Study Citation: OECD Harmonized	ATSDR, (2001) Density). Toxicological profile for asbestos (Upd	ate, September 20	001).
Template: HERO ID:	786664			
			EXTRACTIO	N
Parameter		Data	LATRACTIO	•
Density		2.55 unitless		
CASRN and Test Material		12001-29-5; chrysotile		
Confidentiality, Type, and	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,	•	NR; NR; NR Notes: NR		
Density Type	.	specific gravity		
System		not specified		
Temperature		not specified		
Standard Deviation Results	S	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	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	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
Domain 3. Ouici	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

N/A

High

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

Metric 6:

Overall Quality Determination

Models

Study Citation: OECD Harmonized	ATSDR, (2001) Density). Toxicological profile for asbestos (Upd	ate, September 20	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	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,		NR; NR; NR; NR Notes: NR		
Density Type		specific gravity		
System		not specified		
Temperature		not specified		
Standard Deviation Results	S	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	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	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

Overall Quality Determination High

Models

Metric 6:

N/A

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

Study Citation:	ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).
OECD Harmonized	Density
Template:	

HERO ID: 786664			
		EXTRACTION	V
Parameter	Data		
Density	3.37 unitless		
CASRN and Test Material	12001-28-4; crocidolite		
Confidentiality, Type, and Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR		
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR		
Density Type	specific gravity		
System	not specified		
Temperature	not specified		
Standard Deviation Results	not specified		
Results Details	not specified		
		EVALUATION	<u> </u>
Domain	Metric	Rating	Comments
Domain 1: Substance			
Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.

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

Overan Quanty Determination High

Study Citation: OECD Harmonized	Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30. Density			
Template:	2 < 1 < 0 = =			
HERO ID:	3646977			
			EXTRACTION	
Parameter		Data		
Density		= 3.37 - unit basis not specified		
CASRN and Test Material		12001-28-4; Crocidolite		
	Confidentiality, Type, and Guideline none; not specified; not specified			
Solvent, Reactivity, Storage		NR; NR; NR		
Radiolabel, Source, State, a		NR; NR; Solid; NR Notes: blue asbestos;	chemical formula Na20	O 3FeO Fe2O3 8SiO2 H2O
Density Type Specific gravity				
lystem not specified				
Temperature				
Standard Deviation Results	3	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 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	tv Determi	nation	Medium	

Study Citation: Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.

OECD Harmonized Template:

Density

HERO ID: 3646977

		EXTRACTION		
Parameter	Data			
Density	= 3.45 - unit basis not specified			
CASRN and Test Material	12172-73-5; Amosite			
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; Solid; NR Notes: chemical form	ula 1.5MgO 5.5FeO 8	SiO2 H2O	
Density Type	Specific gravity			
System	not specified			
Temperature 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 Reliability				
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.	

Study Citation: Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30. Density

OECD Harmonized Template:

HERO ID: 3646977

		EXTRACTION
Parameter	Data	

Density	= 2.55 - unit basis not specified
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

Radiolabel, Source, State, and Purity NR; NR; Solid; NR Notes: white asbestos; chemical formula 3MgO 2SiO2 2H2O

Density Type Specific gravity
System not specified
Temperature Not reported
Standard Deviation Results Not reported
Results Details Not reported

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	2			
	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.

Overall Quality Determination

Medium

Study Citation: OECD Harmonized Template:	Larranaga, M. l Density	D., Lewis, R. J., Lewis, R. A. (2016). A	scorbic acid. :117.	
HERO ID:	3982121			
			EXTRACTION	
Parameter		Data		
Density		2.5 - Not reported		
CASRN and Test Material		1332-21-4; asbestos		
Confidentiality, Type, and	Guideline	None; experimental; NR		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR		
Density Type		density		
System		NR		
Temperature		NR		
Standard Deviation Results	S	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 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	Low	Units not reported but expected to be g/cm3.
Domain 3: Other				
2 s.m. 3. Guici	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	Medium	

Study Citation: OECD Harmonized	(2017). PubChe Density	em: Chrysotile.		
Template: HERO ID:	3860485			
ILKO ID	2000103		EXTRACTIO	N
Parameter		Data	EXTRACTIO	
Density		2.2 - 2.6 g/cm3		
CASRN and Test Material		12001-29-5; Not Reported		
Confidentiality, Type, and C	Guideline	Not Reported; Not Reported; Not Report	ted	
Solvent, Reactivity, Storage	, and Stability	Not Reported; Not Reported; Not Report	ted; Not Reported	
Radiolabel, Source, State, a	nd Purity	Not Reported; Not Reported; Not Report	ted; Not Reported	
Density Type		density		
System		Not Reported		
Temperature		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		2.2-2.6 g/cm3		
			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., 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 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 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: Source: ILO-ICSC (not a primary source)

Study Citation: OECD Harmonized	(2017). PubChe Density	em: Chrysotile.		
Template:	Density			
HERO ID:	3860485			
			EXTRACTIO	N
Parameter		Data	232220	-
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 Report	ted	
Solvent, Reactivity, Storag	e, and Stability	Not Reported; Not Reported; Not Report		
Radiolabel, Source, State,		Not Reported; Not Reported; Not Report	_	
Density Type	·	density	-	
System		Not Reported		
Temperature		Not Reported		
Standard Deviation Results	S	Not Reported		
Results Details			een attributed to m	s reported to be between 2.19 & 2.25 g/mL; chrysotile from Canada approx. 2.56 g/mL. inieral 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 (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.
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)

Study Citation: OECD Harmonized Template:	(2017). PubChe Density	em: Crocidolite.		
HERO ID:	3860486			
			EXTRACTIO	N
Parameter		Data		
Density		3.3 - 3.4 not reported		
CASRN and Test Material		12001-28-4; crocidolite		
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; solid; NR Notes: NR		
Density Type		density		
System		not reported		
Temperature		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	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	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 Qualit	v Determi	nation	High	

^{*} Related References: Citing ILO-ICSC.

Study Citation: OECD Harmonized	NIOSH, (2014) Density	. International chemical safety cards (ICI	DC): Chrysotile.	
Template: 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	Guideline	None; experimental; Not reported		
Solvent, Reactivity, Storage, and Stability		NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR		
Density Type		density		
System		Not reported		
Temperature		NR		
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 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 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.

Study Citation: OECD Harmonized	NIOSH, (2014) Density). International chemical safety cards (ICE	OC): Crocidolite.	
Template: HERO ID:	3978150			
			EXTRACTIO	N
Parameter		Data		
Density		3.3 - 3.4 (water =1)		
CASRN and Test Material	l	12001-28-4; Crocidolite		
Confidentiality, Type, and	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storag	ge, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: riebeckite		
Density Type		Relative density		
System		Not reported		
Temperature		Not Reported		
Standard Deviation Result	S	NR		
Results Details		Not Reported		
			EVALUATIO	N 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 (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 Quali	ty Determi	ination	High	

Study Citation: OECD Harmonized	USGS, (2002). Density	Asbestos: Geology, mineralogy, mining,	and uses.	
Template: HERO ID:	3975020			
			EXTRACTIO	N
Parameter		Data		
Density		2.9 - 3.2		
CASRN and Test Material		14567-73-8; tremolite		
Confidentiality, Type, and	Guideline	Not Reported; Not Reported; not reported	ed	
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,	-	NR; NR; NR; NR		
Density Type	•	specific gravity		
System		Not Reported		
Temperature		Not Reported		
Standard Deviation Results	3	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			
20114111 21 1200 110141011	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 J. Oute	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 Determi	ination	High	

Study Citation: USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.

OECD Harmonized

Density

Template:

		E	EXTRACTIO	N
Parameter		Data		
Density		3.1 - 3.25		
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and Gu	iideline	Not Reported; Not Reported; not reported		
Solvent, Reactivity, Storage,	and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and	d Purity	NR; NR; NR; NR		
Density Type		specific gravity		
System		Not Reported		
Temperature		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		specific gravity		
		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 or behaviors.
Domain 2: Test Reliability	y			
•	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.

Study Citation: USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.

OECD Harmonized Template:

Density

Template: HERO ID:

D: 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; NR
Radiolabel, Source, State, and Purity	NR; NR; NR; NR
Density Type	specific gravity
System	Not Reported
Temperature	Not Reported
Standard Deviation Results	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 of other physical/chemical properties or behaviors.
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 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 High

Study Citation: USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.

OECD Harmonized Template:

Density

		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	d	
Solvent, Reactivity, Storage, and Stability	NR; NR; NR		
Radiolabel, Source, State, and Purity	NR; NR; NR; NR		
Density Type	specific gravity		
System	Not Reported		
Temperature	Not Reported		
Standard Deviation Results	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 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

Overall Quality Determination High

Databases

Models

Metric 5:

Metric 6:

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.

Study Citation:	
OECD Harmonized	

Virta, R. L. (2004). Asbestos. 3:288-319.

Density

Template:

		EXTRACTIO	N
Parameter	Data		
Density	2.9 - 3.2		
CASRN and Test Material	14567-73-8; tremolite		
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; NR Notes: NR		
Density Type	specific gravity		
System	not reported		
Temperature	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 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	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 Determ	ination	High	

Study Citation:	Virta, R. L. (2004). Asbestos. 3:288-319.
OECD Harmonized	Density
	Delisity
Template:	
HERO ID:	3859385

		EXTRACTIO	N
Parameter	Data		
Density	3.2 - 3.3		
CASRN and Test Material	12001-28-4; crocidolite		
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; NR Notes: NR		
Density Type	specific gravity		
System	not reported		
Temperature	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 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	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.

Study Citation:	Virta, R. L. (2004). Asbestos. 3:288-319.
OECD Harmonized	Density
Template:	
HERO ID:	3859385

		EXTRACTIO	N
Parameter	Data		
D ''	24.26		
Density CASRN and Test Material	2.4 - 2.6		
	12001-29-5; chrysotile		
Confidentiality, Type, and Guideline	none; not specified; not specified NR; NR; NR; NR		
Solvent, Reactivity, Storage, and Stability			
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR		
Density Type	specific gravity		
System	not reported		
Temperature Standard Deviation Results	not reported		
Results Details	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 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	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 Overlity Detarm	·ination	II;cl	
Overall Quality Detern	เกเลนงก	High	

Study Citation: OECD Harmonized	Virta, R. L. (200 Density	94). Asbestos. 3:288-319.		
Template: HERO ID:	3859385			
			EXTRACTIO)N
Parameter		Data		
Density		3.1 - 3.25		
CASRN and Test Material		12172-73-5; amosite		
Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity		none; not specified; not specified		
		NR; NR; NR		
		NR; NR; NR; NR Notes: NR		
Density Type	•	specific gravity		
System		not reported		
Temperature		not reported		
Standard Deviation Results	S	not reported		
Results Details		not reported		
			EVALUATIO	ON
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.

	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.	
Domain 2. Test Bali	ability				
Domain 2: Test Relia	авину				
	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 Quality Determination

High

OECD Harmonized	Density			
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		
Temperature		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Crystallographic density; 3 values were r	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 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	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.

^{*} 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.

Study Citation: OECD Harmonized	Elsevier, (2021) Density). Reaxys: physical-chemical property dat	ta tor Anthophyl	lite.
Template:	2 charty			
HERO ID:	7924812			
			EXTRACTIO	N
Parameter		Data		
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		NR; NR; NR		
Radiolabel, Source, State, a		NR; NR; Solid; NR		
Temperature		Not Reported		
Standard Deviation Results		Not Reported		
Results Details		Crystallographic density. 1 value reporte	d in Reaxys.	
			EVALUATIO	Ni
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	Measured data are consistent with the subject chemical substance structural features (e.g., presence of certain functional groups) and/or other physical/chemical properties.
	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: Walitzi, E. M.; Walter, F.; Ettinger, K., Zeitschrift fur Kristallographie, 1989, vol. 188, p. 237 - 244.

Study Citation: OECD Harmonized	Elsevier, (2021) Density). Reaxys: physical-chemical property da	ta for Actinolite.	
Template:	•			
HERO ID:	7924815			
			EXTRACTIO	N
Parameter		Data		
Density		2.9 - 3.1 g/cm3		
CASRN and Test Material		12172-67-7; Actinolite		
Confidentiality, Type, and		None; Experimental; Not Reported		
Solvent, Reactivity, Storage		NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; Solid; NR		
Temperature		Not Reported		
Standard Deviation Results	3	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	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	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			

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

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:	5000060			
HERO ID:	5333260			
			EXTRACTION	
Parameter		Data		
Density		3.0 - 3.3 units not given, assumed to be g/g	em3	
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		NR; NR; Solid; NR		
Temperature	-	Not Reported		
Standard Deviation Results	i e	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 (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	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

Study Citation:	-	D., Lewis, R. J., Lewis, R. A. (2016). Hawl	ey's condensed chem	nical dictionary. :57, 58, 1232.
OECD Harmonized	Density			
Template:				
HERO ID:	5333260			
			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	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage		NR; NR; NR; NR		
Radiolabel, Source, State, a		NR; NR; NR; NR		
Temperature	·	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	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	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: 8001410

Study Citation: OECD Harmonized	NLM, (2021). I Density	PubChem: Hazardous Substance Data Ban	nk: Chrysotile, 12001	-29-5.
Template:				
HERO ID:	7924733			
			EXTRACTION	
Parameter		Data		
Danaita		2.4. 2.6 mile met sinon accommed to be	/2	
Density CASRN and Test Material		2.4 - 2.6 units not given, assumed to be gather 12001-29-5; Chrysotile	/cm3	
Confidentiality, Type, and		None; Experimental; Not Reported		
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,		NR; NR; Solid; NR		
Temperature	and I arrey	Not Reported		
Standard Deviation Results	S	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	lity			
Domain 2. Test Kenaon	Metric 3:	Reliability/Unbiased	Medium	The methodology is unknown, but method bias appears unlikely.
	wiedle 3.	(Method Objectivity)	Wiedium	The methodology is unknown, but method bias appears uninkery.
	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 publicly available and peer-reviewed database.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
011 012	4 D-4 •		N/ - 12.	
Overall Quality	ty Determi	nauon	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

Study Citation: OECD Harmonized	NLM, (2021). PubChem: Hazardous Substance Data Bank: Chrysotile, 12001-29-5. d Density				
Template:	j				
HERO ID:	7924733				
			EXTRACTIO	N	
Parameter		Data			
Density		2.19 - 2.56 g/mL			
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; NR			
Radiolabel, Source, State,	and Purity	NR; NR; Solid; NR			
Temperature		Not Reported			
Standard Deviation Results	S	Not Reported			
Results Details		Arizona chystolies (derived from serpentized dolimites): 2.19 - 2.25 g/mLCanada chrystolite: 2.56 g/mLDensity ranges attibuted to mineral impurities or presence of magnesium silicate.			
			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	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: 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 Quali	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, Z. T., Qi, L. J., Zhou, Z. Y. (2019). Black Nephrite Jade from Guangxi, Southern China. Gems & Gemology 55(2):198-215. Density					
Template: HERO ID:	6880237					
			EXTRACTIO	N		
Parameter		Data				
Density		3.015 - 3.149 units not given, assumed to	be g/cm3			
CASRN and Test Material		12172-67-7; Actinolite	2			
Confidentiality, Type, and	Guideline	None; Experimental; Other				
Solvent, Reactivity, Storage		NR; NR; NR				
Radiolabel, Source, State, a		NR; NR; Solid; NR				
Temperature	·	Not Reported				
Standard Deviation Results	3	Not reported				
Results Details		Specific gravity 3.015-3.149; measured u	sing hydrostatical	ly; 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					
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-		
		(Method Objectivity)	Z .	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.		
Overall Qualit	ty Determi	nation	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.

Template:

Parameter

HERO ID: 6880237

EXTRACTION

Density 3.161 - 3.405 units not given, assumed to be g/cm3 CASRN and Test Material 12172-67-7; Actinolite

Data

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 Temperature Not Reported

Standard Deviation Results Not reported

Density

Results Details Specific gravity 3.161-3.405; measured hydrostatically; 4 samples 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 Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

Study Citation:

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

OECD Harmonized

Particle Size

Template:

HERO ID: 1009583

FXTR	Δ	CTION	

EXTRACTION			
Parameter	Data		
Aerodynamic Value	Not Reported		
CASRN and Test Material	12001-29-5; chrysotile		
Confidentiality, Type, and Guideline	None; Experimental; not reported		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and Purity	None; NR; fiber; NR		
Method Type, Particle, Distribution, and Particle	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		
	ENAL LIAMION		

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

Continued on next page ...

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Study Citation: OECD Harmonized Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Particle Size

Template: HERO ID:

1009583

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		High	

Study Citation: OECD Harmonized Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127. Particle Size

Template:

HERO ID: 1009583

EXTR	AC	rt <i>(</i>	N

Parameter	Data
Aerodynamic Value	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	None; NR; fiber; NR Notes: riebeckite
Method Type, Particle, Distribution, and Particle	Not Reported; Not Reported; Not Reported
Size	N (D)
Geometric Standard Deviation	Not Reported
Mean	Not Reported
Standard Deviation Mean	Not Reported
Remarks	aspect ratio generally >10:1

Page NumberNot ReportedPassageNot ReportedMean Size PassageNot ReportedDistributionNot ReportedAdditional Passage DetailsNot Reported

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substanc	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 Reli	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.
Overall Qua	ality Determ	ination	High	

Study Citation:
OECD Harmonized

Template:

HERO ID: 1009583

EXTRACTION

Parameter	Data		
Aerodynamic Value	Not Reported		
CASRN and Test Material	12172-73-5; cummingtonite-grunerite		
Confidentiality, Type, and Guideline	None; Experimental; not reported		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and Purity	None; NR; fiber; NR Notes: amosite		
Method Type, Particle, Distribution, and Particle	Not Reported; Not Reported; Not Reported		
Size	N · P		
Geometric Standard Deviation	Not Reported		
Mean	Not Reported		
Standard Deviation Mean	Not Reported		
Remarks	aspect ratio generally >10:1		

Page NumberNot ReportedPassageNot ReportedMean Size PassageNot ReportedDistributionNot ReportedAdditional Passage DetailsNot Reported

Particle Size

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substanc	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 Reli	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.
Overall Qua	ality Determ	ination	High	

Study Citation:
OECD Harmonized

OECD Harmonized Template:

Parameter

HERO ID: 1009583

EXTRACTION

Aerodynamic Value	Not Reported
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Particle Size

CASRN and Test Material 17068-78-9; anthophyllite
Confidentiality, Type, and Guideline None; Experimental; not reported

Data

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and Purity None; NR; fiber; NR

Method Type, Particle, Distribution, and Particle Not Reported; Not Reported; Not Reported; Not Reported

Size

Geometric Standard Deviation Not Reported
Mean Not Reported
Standard Deviation Mean Not Reported
Not Reported

Remarks aspect ratio generally <10:1

Page NumberNot ReportedPassageNot ReportedMean Size PassageNot ReportedDistributionNot ReportedAdditional Passage DetailsNot 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.
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.

Study	Citation:
OECT) Harmonized

OECD Harmonized

nized Particle Size

Template:

Parameter

HERO ID: 1009583

EXT	$\Gamma R A$	C	П	U.	N

Aerodynamic Value	Not Reported
CASRN and Test Material	14567-73-8; tremolite
Confidentiality, Type, and Guideline	None; Experimental; not reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR
Radiolabel, Source, State, and Purity	None; NR; fiber; NR
Method Type, Particle, Distribution, and Particle	Not Reported; Not Reported; Not Reported

Data

Size

Geometric Standard Deviation Not Reported
Mean Not Reported
Standard Deviation Mean Not Reported

Remarks aspect ratio generally <10:1

Page NumberNot ReportedPassageNot ReportedMean Size PassageNot ReportedDistributionNot ReportedAdditional Passage DetailsNot 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.
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	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	ination	High	

Study Citation:
OECD Harmonized

Template:

Parameter

Particle Size

HERO ID: 1009583

EXT	$\Gamma R A$	C	П	U.	N

Aerodynamic Value	Not Reported
CASRN and Test Material	13768-00-8; actinolite
Confidentiality, Type, and Guideline	None; Experimental; not reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR
Radiolabel, Source, State, and Purity	None; NR; fiber; NR
Method Type, Particle, Distribution, and Particle	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

Data

Page Number Not Reported Not Reported Passage 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 other physical/chemical properties.
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 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.

Overall Quality Determination High

pictorial presentation. Particle Size

OECD Harmonized

Template:

HERO ID: 785518

EXTR	ACTION

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, Distribution, and Particle	Not Reported; other; other; Not Reported					
Size						
Geometric Standard Deviation	NR - NR NR					
Mean	NR - NR					
Standard Deviation Mean	NR					
Remarks	6.7% of fibers exceeded a 0.61 μ m width. Fifty-three percent of all fibers were < 1.0 μ min length while 6% exceeded 5 μ m in length					
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	e			
	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 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	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.

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Study Citation: 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

Template:

Particle Size

HERO ID: 785518

EVALUATION	

Domain	Metric	Rating	Comments
	termination	Medium	

^{*} 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).

Study	Citation:	Bailey, I	K. F.,	Kelse, J.	., Wy	lie, A	A. G., 1	Lee, R	. J. (2006).	The a	sbestiform	and	prismatic	mineral	growt	h habit	and th	neir rela	tionship	to cancer	studies: A	4
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pictorial presentation. Particle Size

NR

OECD Harmonized

Additional Passage Details

Overall Quality Determination

Template: HERO ID:

785518

EXTRACTION							
Parameter	Data						
Aerodynamic Value	NR - NR						
CASRN and Test Material	77536-68-6; winchite						
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, Distribution, and Particle	Not Reported; other; Other; Not Reported						
Size	NE VENE						
Geometric Standard Deviation	NR - NR NR						
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						

			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	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	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.

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: Bouffant, Le, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33.

OECD Harmonized

Particle Size

Template: HERO ID:

HERO ID: 3084215

EXTRACTION					
Parameter	Data				
Aerodynamic Value	<1.2 μm				
CASRN and Test Material	12172-73-5; amosite				
Confidentiality, Type, and Guideline	None; Experimental; Scanning	electron microscope (SEM)			
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, and Purity	NR; NR; NR; NR Notes: NR				
Method Type, Particle, Distribution, and Particle Size	microscopic examination; prin	nary particle; other; Not Reported			
Geometric Standard Deviation	Not Reported				
Mean	Not Reported				
Standard Deviation Mean	Not Reported				
Remarks	diameter range = <0.10 to 1.2	μm (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			
Domain	Metric	Rating	Comments		

			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 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	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.	

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Study Citation: Bouffant, Le, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33.

OECD Harmonized Particle Size

Template:

HERO ID: 3084215

		EVALUATION		
Domain	Metric	Rating	Comments	
Overall Quality Determination		High		

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

Study Citation:	Bouffant, Le, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33.
OECD Harmonized	Particle Size

Template:

HERO ID: 3084215

		EXTRACTIO
Parameter	Data	

Aerodynamic Value	$<$ 1.0 μ m
CASRN and Test Material	12001-28-4: crocidolite

CASRN and Test Material 12001-28-4; crocidolite

Confidentiality, Type, and Guideline None; Experimental; Scanning electron microscope (SEM)

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Method Type, Particle, Distribution, and Particle microscopic examination; primary particle; other; Not Reported

Size

Geometric Standard Deviation 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 NumberNot ReportedPassageNot ReportedMean Size PassageNot ReportedDistributionNot ReportedAdditional Passage DetailsNot Reported

Overall Quality Determination

			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 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	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.	

High

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

Study Citation: Bouffant, Le, L. (1980). Physics and chemistry of asbestos dust. IARC Scientific Publication No. 30 (30):15-33. Particle Size

Template:

Domain 3: Other

Metric 5:

Overall Quality Determination

HERO ID: 3084215

HERO ID: 3084215					
		EXTRACTIO	ON .		
Parameter	Data				
Aerodynamic Value	<0.8 μm				
CASRN and Test Material	12001-29-5; chrysotile				
Confidentiality, Type, and Guideline	None; Experimental; Scanning electron microscope (SEM)				
Solvent, Reactivity, Storage, and Stability	NR; NR; NR				
Radiolabel, Source, State, and Purity	NR; NR; NR; NR Notes: Chrysotiles A	A and B			
Method Type, Particle, Distribution, and Particle	microscopic examination; primary part	icle; other; Not Repo	orted		
Size	N. D I				
Geometric Standard Deviation	Not Reported				
Mean	Not Reported				
Standard Deviation Mean	Not Reported				
Remarks	diameter range = <0.10 to $0.80 \mu m$ (reported in citation HERO ID 3615279)				
Page Number	Not Reported				
Passage Maga Sing 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 Reliability					
Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was bissed		
Metric 3:	(Method Objectivity)	Mediuili	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.		
Metric 4.	Remadinity// mary tical friction	Tilgii	Data are obtained by accepted standard analytical methods.		

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

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

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 OR includes references to the original sources.

Study Citation: OECD Harmonized	Bouffant, Le, L. (1 Particle Size	980). Physics and chemistry of asbest	os dust. IARC So	cientific Publication No. 30 (30):15-33.			
Template:	2004215						
HERO ID:	3084215						
D		D 4	EXTRACTIO	N			
Parameter		Data					
Aerodynamic Value		<1.4 μm					
CASRN and Test Material		77536-87-5; anthophyllite					
Confidentiality, Type, and G	duideline	None; Experimental; Scanning electron	microscope (SEM)	in citation HERO ID 3615279)			
Solvent, Reactivity, Storage		NR; NR; NR; NR	1 \ /				
Radiolabel, Source, State, and	·	NR; NR; NR; NR Notes: NR					
Method Type, Particle, Dist	•	microscopic examination; primary partic	ele; other; Not Repo	orted			
Size			•				
Geometric Standard Deviati	on	Not Reported					
Mean		Not Reported					
Standard Deviation Mean		Not Reported					
Remarks		diameter range = <0.10 to 1.4 μ 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	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			
		(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.			

Overall Quality Determination

High

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

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 & Technology 17(11):643-648.

OECD Harmonized Template:

Particle Size

HERO ID:

55

EXTR	ACTION

	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, 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, Distribution, and Particle	determination of fibre length and diameter distributions; primary particle; counted distribution; Not Reported
Size Geometric Standard Deviation	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	N	
Domain		Metric		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 Relial	bility				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.	

4	C		
continued	irom	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 & Technology 17(11):643-648.

OECD Harmonized

Particle Size

Template:

HERO ID:	55
TIBLE ID.	

		EVALUATION		
Domain	Metric	Rating	Comments	
Overall Quality Determination		High		

Study Citation: OECD Harmonized	electron microscopy. Environmental Science & Technology 17(11):643-648.				
Template: HERO ID:	55				
			EXTRACTIO	N	
Parameter		Data			
Aerodynamic Value		0.24 um -			
CASRN and Test Material		12172-73-5; Amosite			
Confidentiality, Type, and G	uideline	None; Experimental; Membrane filter wit	th TEM quantifica	tion	
Solvent, Reactivity, Storage				ared using DMF, glacial acetic acid and water; NR; NR; NR	
Radiolabel, Source, State, an	· ·	NR; airborne samples; solid; NR Notes: I			
Method Type, Particle, Dist	•			imary particle; counted distribution; Not Reported	
Size			7.1		
Geometric Standard Deviati	on	NR - NR			
Mean		Not Reported			
Standard Deviation Mean		Not Reported			
Remarks) um length from f	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 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.	
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	

High

Overall Quality Determination

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.

OECD Harmonized

Particle Size

Template:

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, Distribution, and Particle Size	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

			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 (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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 ...

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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.

OECD Harmonized Template:

Particle Size

HERO ID: 3582618

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality 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.

Study Citation:		ummett, 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		rican Mineralogist 92(10):1704-1713.		
Template:	Particle Size			
HERO ID:	3582618			
		EXTRACTION		
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		
Radiolabel, Source, State, a	and Purity	NA; New Idria, California; Solid; fibers and fiber bundles; 96% Chrysotile		
Method Type, Particle, Dis Size	tribution, and Particle	microscopic examination; aggregate; other; Not Reported		
Geometric Standard Deviat	ion	Not Reported		
Mean Not Reported		Not Reported		
Standard Deviation Mean Not Reported		Not Reported		
Remarks		Mean length: 2.1 µm		
Page Number		Not Reported		
Passage		Not Reported		
Mean Size Passage		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 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 Quality Determination High

Not Reported

Not Reported

Distribution

Additional Passage Details

^{*} 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.

Study Citation	Chatfield, E. J. (1999). Correlated measurement	ante of airborna achaetoe containing na	erticles and surface dust	American society for testing and materials
Study Challon.	Chatheld, E. J. (1999). Conferated measureme	this of allouthe aspesios-containing pa	nucies and surface dust. I	American society for testing and materials

special technical publication 1342:378-402. Particle Size

OECD Harmonized

Template:

HERO ID: 6892000

tion of asbestos fibres — Direct transfer transmission electron microscopy method and ASTM D5755-95 Standard Test Method for Microvacuu Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations NR;	EXTRACTION					
CASRN and Test Material Confidentiality, Type, and Guideline None; Experimental; Transmission electron microscope analysis of airborne dust samples from an elutriator. ISO 10312 Ambient air — Determin tion of a sbestos fibres — Direct transfer transmission electron microscopy method and ASTM D5755-95 Standard Test Method for Microvacuu Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations NR; NR; NR; NR Radiolabel, Source, State, and Purity Method Type, Particle, Distribution, and Particle Size Geometric Standard Deviation Mean Not Reported Mean Not Reported Mean Size Passage Not Reported Not Reported						
Confidentiality, Type, and Guideline None; Experimental; Transmission electron microscope analysis of airborne dust samples from an elutriator. ISO 10312 Ambient air — Determin tion of asbestos fibres — Direct transfer transmission electron microscopy method and ASTM D5755-95 Standard Test Method for Microvacuu Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations NR; NR; NR; NR Radiolabel, Source, State, and Purity NR; Ceiling tile, floor tile, acoustic surfacing material, fireproofing, Pipe elbow cement; Solid; NR Notes: particles from chrysotile-containin materials microscopic examination; primary particle; other; Not Reported Not Reported						
tion of asbestos fibres — Direct transfer transmission electron microscopy method and ASTM D5755-95 Standard Test Method for Microvacuu Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations NR;	12001-29-5; chrysotile					
Radiolabel, Source, State, and Purity Method Type, Particle, Distribution, and Particle Size Geometric Standard Deviation Mean O.5 - 34.06 µ m Not Reported Not Reported Not Remarks Not Reported Page Number Passage Not Reported Mean Size Passage Not Reported Mot Reported Mot Reported Not Reported Mot Reported Not Reported Not Reported Not Reported Not Reported Not Reported Not Reported Mot Reported Mot Reported Not Reported Mot Reported Mot Reported Not Reported Mot Reported	None; Experimental; Transmission electron microscope analysis of airborne dust samples from an elutriator. ISO 10312 Ambient air — Determination 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					
Method Type, Particle, Distribution, and Particle Size Geometric Standard Deviation Mean Standard Deviation Mean Not Reported Page Number Passage Not Reported Mean Size Passage Not Reported Mean Size Passage Not Reported Additional Passage Details Not Reported Mean Size Passage Not Reported Not Reported Mean Size Passage Details Not Reported Not Reported	NR; NR; NR					
Size Geometric Standard Deviation 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						
Geometric Standard Deviation 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** **EVALUATION**	microscopic examination; primary particle; other; 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 Not Reported Not Reported EVALUATION						
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	·					
Page Number Not Reported Passage Not Reported Mean Size Passage Not Reported Distribution Not Reported Additional Passage Details Not Reported EVALUATION						
Page Number Not Reported Passage Not Reported Mean Size Passage Not Reported Distribution Not Reported Additional Passage Details Not Reported EVALUATION	Not Reported					
Passage Not Reported Mean Size Passage Not Reported Distribution Not Reported Additional Passage Details Not Reported EVALUATION	·					
Distribution Not Reported Additional Passage Details Not Reported EVALUATION	Not Reported					
Additional Passage Details Not Reported EVALUATION						
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 bia towards a particular product or outcome.	is biased					
Metric 4: Reliability/Analytical Method High Data are obtained by accepted standard analytical methods, including, but not limit OECD guidelines for physical-chemical properties or other developed standard; he ever, there is some uncertainty if the data reported is for asbestos or the dust partic	rd; how-					
Domain 3: Other						
Continued on next page						

			continucu from pre	vious page
Study Citation:	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.			
OECD Harmonized	Particle Size	r		
Template:				
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.

Ct 1 Ct tt	CL CC D I D A I (1000)	0: 1	C 1	. 1
Study Citation:	Cluff, D. L., Patitsas, A. J. (1992).	Size characterization of asbestos fibers by	y means of electrostatic alignment and I	ight-scattering techniques. Aerosol

Science and Technology 17(3):186-198. Particle Size

OECD Harmonized

Template:

HERO ID: 3096394

		EXTRACTION	
Parameter	Data		
Aerodynamic Value	0.16 (0 min centrifugation), (0.15 (5 min centrifugation), 0.12 (15 min centrif	fugation), and 0.11 um (20 min centrifugation) -
CASRN and Test Material	12001-28-4; Crocidolite		
Confidentiality, Type, and Guideline	None; Experimental; NA		
Solvent, Reactivity, Storage, and Stability	Light mineral oil; NR; NR; N	NR	
Radiolabel, Source, State, and Purity	NA; Union Internationale Co	ontre le Cancer; Solid; NR Notes: Solutions son	icated for ~60s and centrifuged for 0, 5, 15, or 20 min, respectively
Method Type, Particle, Distribution, and Particle	Laser scattering/diffraction;	aggregate; other; Not Reported	
Size	N . B 1		
Geometric Standard Deviation	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			
Matria 1.	Dammagamtatirramaga	High Data and manage	

			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 Reliabilit	y			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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: 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.

OECD Harmonized

Particle Size

Template: HERO ID:

3096394

		EVALUATION		
Domain	Metric	Rating	Comments	
Overall Quality Determination		High		

Study Chation: Duncan, K. E., Cook, F. M., Gavett, S. H., Daney, L. A., Manoney, K. K., Olho, A. J., Roggii, V. L., Devini, K. B. (2014). In vitro determinants of ast	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 asbesto
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fiber toxicity: effect on the relative toxicity of Libby amphibole in primary human airway epithelial cells. Particle and Fibre Toxicology 11(2):2.

OECD Harmonized

Particle Size

Template:

HERO ID: 2342642

Parameter	Data
Aerodynamic Value	Total particle mean width = $0.44 \pm 0.01~0.43 \pm 0.01$ for RTI and UICC 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 ± 1.6 , 5.6 ± 0.6 for RTI and UICC amosite, respectively

EXTRACTION

Standard Deviation Mean	Not Reported
Remarks	Total particle mean length = 6.4 ± 0.6 2.1 ± 0.3 and mean aspect ratio = 16.9 ± 1.6 , 5.6 ± 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

			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 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	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.

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.

OECD Harmonized Template:

Particle Size

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		High	

Study Citation:				Ghio, A. J., Roggli, V. L., Devlin, R. B. (2014). In vitro determinants of asbestos y human airway epithelial cells. Particle and Fibre Toxicology 11(2):2.		
OECD Harmonized	Particle Size	et on the relative toxicity of Libby amp	mibole in primar	y numan an way epimenai cens. Farticle and Fibre Toxicology 11(2).2.		
Template:						
HERO ID:	2342642					
			EXTRACTIO	N		
Parameter		Data				
Aerodynamic Value		Total particle mean width = 0.36 ± 0.02 u	ım for LA (2000) a	nd 0.36 ± 0.01 µm for LA (2007) -		
CASRN and Test Material		1318-09-8; Libby amosite	101 2.11 (2000) 0	obo ± olo1 a (2.07)		
Confidentiality, Type, and C	Guideline	None; Experimental; SEM and TEM analysis				
Solvent, Reactivity, Storage		NR; NR; NR				
Radiolabel, Source, State, a	•	NR; Libby Montana; NR; NR Notes: san	npled 2000 and 200	07		
Method Type, Particle, Dist	•	microscopic examination; primary partic	•			
Size Geometric Standard Deviati	on	Not Reported				
Mean	OII	Not Reported				
Standard Deviation Mean		Not Reported				
Remarks		Total particle mean length = 3.7 and 2.3 um \pm 0.2 um and mean aspect ratio = 12.8 ± 0.6 , 8.4 ± 0.7 for LA (2000) and LA (2007) Not Reported				
Page Number						
Passage						
Mean Size Passage		Not Reported				
Distribution		Not Reported				
Additional Passage 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	fv					
	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	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.		
	mente o.	THOUGH.	1 1/1 1	Taking of this factor is not appreciate to this kind of information.		

Study Citation: Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30. Particle Size

OECD Harmonized Template:

Additional Passage Details

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, and Stability	NR; NR; NR	
Radiolabel, Source, State, and Purity	NR; NR; Solid; NR Notes: white asbestos; chemical formula 3MgO 2SiO2 2H2O	
Method Type, Particle, Distribution, and Particle	other; other; Not Reported; Not Reported	
Size Geometric Standard Deviation	Not Reported	
Mean	Not Reported	
Standard Deviation Mean	Not Reported	
Remarks	Approximate diameter of smallest fibers: 0.01 micron	
Page Number	Not Reported	
Passage	Not Reported	
Mean Size Passage	Not Reported	
Distribution	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 (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

Not Reported

Study Citation:

Parameter

Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.

OECD Harmonized Template:

HERO ID: 3646977

EXTRACTION

Aerodynamic Value Not Reported

CASRN and Test Material 12001-29-5; Crocidolite

Particle Size

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; Solid; NR Notes: blue asbestos; chemical formula Na2O 3FeO Fe2O3 8SiO2 H2O

Method Type, Particle, Distribution, and Particle other; other; Not Reported; Not Reported

Size

Geometric Standard Deviation Not Reported
Mean Not Reported
Standard Deviation Mean Not Reported

Remarks Approximate diameter of smallest fibers: 0.08 micron

Data

Page NumberNot ReportedPassageNot ReportedMean Size PassageNot ReportedDistributionNot ReportedAdditional Passage DetailsNot Reported

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 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

EVALUATION

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:DatabasesN/ARating of this factor is not applicable to this kind of information.Metric 6:ModelsN/ARating of this factor is not applicable to this kind of information.

Overall Quality Determination

NEED TO FIX

Study Citation:

Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.

OECD Harmonized

emnlate:

Template:

Parameter

HERO ID: 3646977

EXTR	AC	rt <i>(</i>	N

Aerodynamic Value Not Reported
CASRN and Test Material 12001-29-5; amosite

Particle Size

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; Solid; NR Notes: chemical formula 1.5MgO 5.5FeO 8SiO2 H2O

Metric

Method Type, Particle, Distribution, and Particle other; other; Not Reported; Not Reported

Size

Geometric Standard Deviation Not Reported
Mean Not Reported
Standard Deviation Mean Not Reported

Remarks Approximate diameter of smallest fibers: 0.1 micron

Data

Page NumberNot ReportedPassageNot ReportedMean Size PassageNot ReportedDistributionNot ReportedAdditional Passage DetailsNot Reported

EVALUATION	
Rating	

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	ability			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased

Metric 3: Reliability/Unbiased
(Method Objectivity)

Metric 4:

Reliability/Unbiased Medium There is no indication that the methodology for producing the information was biased (Method Objectivity) towards a particular product or outcome

Comments

(Method Objectivity) towards a particular product or outcome
Reliability/Analytical Method Low The analytical method is unknown and there is no indication that a reliable method was

used

Domain 3: Other

Domain

Metric 5: Databases N/A Rating of this factor is not applicable to this kind of information.

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

Overall Quality Determination

NEED TO FIX

Study Citation: OECD Harmonized Gentry, J. W. (1987). Survey of recent measurements with asbestos fibers. Journal of Aerosol Science 18(5):479-486.

Particle Size

Template:

HERO ID: 3580641

EVTD	ACTION

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, and Stability	aqueous suspensions; NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; Solid; NR Notes: NA
Method Type, Particle, Distribution, and Particle	microscopic examination; primary particle; Not Reported; Not Reported
Size Geometric Standard Deviation	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 0.02-0.05 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 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	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.

Study Citation: OECD Harmonized Gentry, J. W. (1987). Survey of recent measurements with asbestos fibers. Journal of Aerosol Science 18(5):479-486.

Particle Size

Template:

HERO ID: 3580641

E	VA]	LU	AT	ION
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Domain Rating Metric Comments

Overall Quality Determination Medium Study Citation: OECD Harmonized Gentry, J. W. (1987). Survey of recent measurements with asbestos fibers. Journal of Aerosol Science 18(5):479-486.

Template:

Additional Passage Details

HERO ID: 3580641

Particle Size

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, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; Solid; NR Notes: NA
Method Type, Particle, Distribution, and Particle	microscopic examination; primary particle; Not Reported; Not Reported
Size	M. D. and J.
Geometric Standard Deviation	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

			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 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	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.

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)

Overall Quality Determination Medium

Study Citation: Huntington, J. C., Ptasienski, J. J., Bunker, K. L., Strohmeier, B. R., Orden, Van, 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.

OECD Harmonized

Particle Size

Template:

FXTR	ACTION	

Parameter	Data
Aerodynamic Value	Not Reported
CASRN and Test Material	12001-29-5; Chrysotile 1866 Standard Reference Material
Confidentiality, Type, and Guideline	None; Experimental; None
Solvent, Reactivity, Storage, and Stability	Buehler Epoxicure Resin; NR; NR; NR
Radiolabel, Source, State, and Purity	NA; National Institute of Standards and Technology; Solid; NR Notes: Samples prepared by vacuum impregnation in epoxy
Method Type, Particle, Distribution, and Particle	other; primary particle; counted distribution; Not Reported
Size	N (D)
Geometric Standard Deviation	Not Reported
Mean	Not Reported
Standard Deviation Mean	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
Mean Size Passage	Not Reported
Distribution	Not Reported
Additional Passage Details	Not Reported

			EVALUATIO	N
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	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Relia	ability			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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: Huntington, J. C., Ptasienski, J. J., Bunker, K. L., Strohmeier, B. R., Orden, Van, 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.

OECD Harmonized Template:

Particle Size

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Dete	ermination	High	

Study Citation:				en, Van, D. R., Lee, R. J. (2008). A new method for fracturing mineral particles
OECD Harmonized	for cross-sectional Particle Size	FESEM analysis. Periodico di Mineral	logia 77(2):43-5	0.
Template:	Particle Size			
HERO ID:	3583340			
			EXTRACTIO	N
Parameter		Data		
Aerodynamic Value		Not Reported		
CASRN and Test Material		12001-28-4; Chrysotile 1866 Standard Re	ference Material	
Confidentiality, Type, and C	anideline	None; Experimental; None	rerence material	
Solvent, Reactivity, Storage		Buehler Epoxicure Resin; NR; NR; NR		
Radiolabel, Source, State, a		_	echnology: Solid	NR Notes: Samples prepared by vacuum impregnation in epoxy
Method Type, Particle, Dis	•	other; primary particle; counted distribution		The Troices, Samples prepared by Aucuani impregnation in epoxy
Size Geometric Standard Deviat	ion	Not Reported		
Mean		Not Reported		
Standard Deviation Mean		Not Reported		
Remarks		Mean diameter = 0.09 um (major chord) a	and 0.07 um (mino	or 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.
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)	Č	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.

High

Overall Quality Determination

Study Citation:	Huntington, J. C., Ptasienski, J. J., Bunker, K. L., Strohmeier, B. R., Orden, Van, D. R., Lee, R. J. (2008). A new method for fracturing mineral part for cross-sectional FESEM analysis. Periodico di Mineralogia 77(2):43-50.				
OECD Harmonized	for cross-sectional Particle Size	FESEM analysis. Periodico di Mineral	logia 77(2):43-5	60.	
Template:	rarucie Size				
HERO ID:	3583340				
			EXTRACTIO	N .	
Parameter		Data			
Aerodynamic Value		Not Reported			
CASRN and Test Material		12172-73-5; Chrysotile 1866 Standard Re	eference Material		
Confidentiality, Type, and C	Guideline	None; Experimental; None			
Solvent, Reactivity, Storage	e, and Stability	Buehler Epoxicure Resin; NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NA; National Institute of Standards and T	echnology; Solid	NR Notes: Samples prepared by vacuum impregnation in epoxy	
Method Type, Particle, Dis	tribution, and Particle	other; primary particle; counted distribution	on; Not Reported		
Size Geometric Standard Deviat	ion	Not Reported			
Mean	1011	Not Reported			
Standard Deviation Mean		Not Reported			
Remarks		Mean diameter = 0.23 um (major chord) a	and 0.15 um (min	or 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.	
Domain 2: Test Reliabil	itx				
Domain 2. Test Kellauli	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-	
	monie J.	(Method Objectivity)	Iligii	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					
Domain J. Outo	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.	
				σ · · · · · · · · · · · · · · · · · · ·	
Overall Qualit					

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

Additional Passage Details

Particle Size

not reported

Template:

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, and Stability	deionized H2O (Millipore); suspension filtered through 0.4 µm pore size polycarbonate filter; NR; NR; NR
Radiolabel, Source, State, and Purity	NR; National Institute of Environmental Health Sciences; solid; NR Notes: Intermediate-length chrysotile
Method Type, Particle, Distribution, and Particle	microscopic examination; other; counted distribution; Not Reported
Size Geometric Standard Deviation	not reported, not reported not reported
	not reported - not reported not reported
Mean	ca_lower Untreated fibers: size range <3 μm count frequency: ca. 275; size range 3-10 μm count frequency: ca. 205; size range >10 μm count frequency: ca. 25; treated fibers: size range <3 μm count frequency: ca. 340; size range 3-10 μm count frequency: ca. 175; size range >10 μm 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

			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	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	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.
		Со	ntinued on next p	page

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 Template:

Particle Size

HERO ID: 3080916

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

Overall Quality Determination High

Study Citation: LeBaron, E. I., Boettner, E. A. (1980). Fiber motion analysis by two-pulse holography. Applied Optics 19(6):891-894.

OECD Harmonized

Particle Size

Template:

		EXTRACTIO	N		
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-pulse in-lin	e Fraunhofer holog	graphy aerosol spectrometer		
Solvent, Reactivity, Storage, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, and Purity	NR; NR; fiber solid; NR Notes: NR				
Method Type, Particle, Distribution, and Particle Size	Laser scattering/diffraction; primary parti	icle; counted distri	bution; Not Reported		
Geometric Standard Deviation	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, $L = 145 + /-100 \text{ um}$		
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.		
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	High	Data are obtained by accepted standard analytical methods.		
Domain 3: Other					
Domain 3: Other Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.		

Study Citation: OECD Harmonized Lowers, H. A., Bern, A. M. (2009). Particle size characterization of water-elutriated Libby amphibole 2000 and RTI international amosite. :3.

Particle Size

Template:

	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, 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, Distribution, and Particle	microscopic examination; other; Not Reported
Size Geometric Standard Deviation	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
Mean Size Passage	Not Reported
Distribution	NR - NR
Additional Passage Details	NR

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	2			
	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	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.

Study Citation: OECD Harmonized Lowers, H. A., Bern, A. M. (2009). Particle size characterization of water-elutriated Libby amphibole 2000 and RTI international amosite. :3.

Template:

Particle Size

		EVALUATION		
Domain	Metric	Rating	Comments	
Overall Quality Dete	rmination	High		

Study Citation:
OECD Harmonized
Template:

Lowers, H. A., Bern, A. M. (2009). Particle size characterization of water-elutriated Libby amphibole 2000 and RTI international amosite. :3.

Particle Size

EXTRAC	TION
LAINAC	11011

Parameter	Doto EXTRACTION
rarameter	Data
Aerodynamic Value	NR - NR
CASRN and Test Material	12172-73-5; Amosite
Confidentiality, Type, and Guideline	None; Experimental; Non-guideline: total particle characterization; SEM
Solvent, Reactivity, Storage, 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, Distribution, and Particle	microscopic examination; other; Not Reported
Size	
Geometric Standard Deviation	NR - NR NR
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
Mean Size Passage	Not Reported
Distribution	NR - NR
Additional Passage Details	NR

Domain		Metric	EVALUATIO Rating	
		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
Domain 2: Test Reliabi	litv			
	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				
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: Myasoedov, A. V., Kalmykov, A. E., Kirilenko, D. A., Sorokin, L. M. (2017). TEM investigation of nanostructures with a high aspect ratio. Springer

Proceedings in Physics, vol. 186:143-148.

OECD Harmonized

Particle Size

Template:

HERO ID: 6876819

EXTRACTION

	EXTRACTION
Parameter	Data
Aerodynamic Value	Not Reported
CASRN and Test Material	Not Reported; chrysotile
Confidentiality, Type, and Guideline	none; Experimental; high-resolution TEM
Solvent, Reactivity, Storage, and Stability	NR; NR; NR

Radiolabel, Source, State, and Purity
None; NR; fibers; NR
Method Type, Particle, Distribution, and Particle
microscopic examinati

microscopic examination; other; counted distribution; Not Reported

Size

Not Reported

Mean

nm

Standard Deviation Mean

Geometric Standard Deviation

Not Reported

Remarks

average diameter ~20 nm; from figure range 6-42 nm

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 other physical/chemical properties or behaviors.
Domain 2: Test Reliab	oility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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: Myasoedov, A. V., Kalmykov, A. E., Kirilenko, D. A., Sorokin, L. M. (2017). TEM investigation of nanostructures with a high aspect ratio. Springer

Proceedings in Physics, vol. 186:143-148.

OECD Harmonized Template:

Particle Size

HERO ID: 6876819

EVALUATION.

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality D	etermination	High	

Study Citation:	
OECD Harmonized	

NIH, (2016). Report on carcinogens: Asbestos.

Particle Size

Template:

HERO ID: 3982328

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$\mathbf{E}\mathbf{X}\mathbf{T}$	IKA	11			IN.

EXTRACTION				
Parameter	Data			
Aerodynamic Value	NR - NR			
CASRN and Test Material	1332-21-4; chrysotile			
Confidentiality, Type, and Guideline	none; Not specified; not specified			
Solvent, Reactivity, Storage, and Stability	NR; NR; NR			
Radiolabel, Source, State, and Purity	NR; occurs naturally; solid; NR			
Method Type, Particle, Distribution, and Particle	other; other; Not Reported; Not Reported			
Size Geometric Standard Deviation	NR - NR NR			
Mean	NR - NR			
Standard Deviation Mean	NR			
Remarks	fiber bundles with lengths ranging from several millimeters to >10 cm			
Page Number	Not Reported			
Passage	NR - NR			
Mean Size Passage	Not Reported			
Distribution	NR - NR			
Additional Passage Details	NR			

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	2			
	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	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: NIH, (2016). Report on carcinogens: Asbestos. **OECD Harmonized** Particle Size

Template:

HERO ID:	3982328			
		EVALUATION		
Domain	Metric	Rating	Comments	
Overall Qua	ality Determination	High		

^{*} 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: Orden, Van, D. R., Lee, R. J., Badger, S. (2006). Characterizing asbestos fiber comminution resulting from preparation of environmental samples. Powder

Technology 162(3):183-189.

OECD Harmonized

Particle Size

Template:

HERO ID: 3584949

Parameter	Data
Aerodynamic Value	greater than or equal to 0.02 μ m - less than or equal to 0.05 μ 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 collapse); analysis via transmission electron microscope
Solvent, Reactivity, Storage, and Stability	NR; NR; Samples were collected on mixed cellulose ester filters and prepared in general accordance with standard direct preparation methodologies.; NR
Radiolabel, Source, State, and Purity	NR; WTC air samples; single fibers; with a few bundles; NR
Method Type, Particle, Distribution, and Particle Size	microscopic examination; other; mass based distribution; D99
Geometric Standard Deviation	Not Reported
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) µm
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 μ m

in accordance with the method used.

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 (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

Study Citation: Orden, Van, D. R., Lee, R. J., Badger, S. (2006). Characterizing asbestos fiber comminution resulting from preparation of environmental samples. Powder

Technology 162(3):183-189.

OECD Harmonized

Particle Size

Template:

HERO ID: 3584949

EVALUATION

Domain Metric Rating Comments

Overall Quality Determination

High

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.

OECD Harmonized

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 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, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; asbestos mill air samples; NR; NR Notes: NR
Method Type, Particle, Distribution, and Particle Size	microscopic examination; other; counted distribution; Not Reported
Geometric Standard Deviation	not reported - not reported not reported
Mean	not reported - not reported
Standard Deviation Mean	not reported

Standard Deviation Mean not reported

Remarks

Highest and second highest distribution classes were the 3.0-4.2 µm and 4.3-6.0 µm 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 µm: 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 µm: 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 µm: 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

 $\begin{tabular}{lll} Mean Size Passage & Not Reported \\ Distribution & 1.5 \ \mu m - 24.2 \ other \\ \end{tabular}$

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 = 10.

16, 0, 0; 10.1-20.0 f/mL = 14, 0, 0; 20.1-30.0 f/mL = 3, 0, 0.

	EVALUATION					
	Metric	Rating	Comments			
ric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
ric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.			
ric 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.			
ric 4:	Reliability/Analytical Method	Medium	The analytical method is non-standard but is expected to be appropriate.			
	ic 2:	ic 1: Representativeness ic 2: Appropriateness ic 3: Reliability/Unbiased (Method Objectivity)	ic 1: Representativeness High ic 2: Appropriateness High ic 3: Reliability/Unbiased (Method Objectivity)			

Study Citation:	Parsons, R. C., 30(1):63-75.	Bryant, D. G., Edstrom, H. W.	(1986). Variation in fibre	and dust counts in an asbestos mine and mill. Annals of Occupational Hygiene
OECD Harmonized	Particle Size			
Template: HERO ID:	3083397			
			EVALUATIO	N
Domain		Metric	Rating	Comments
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	

Study Citation:	Patitsas, A. J. (1988). Size characterization of asbestos fibers using the Rayleigh-Debye-Gans theory. Journal of Colloid and Interface Science 122(1):15-
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OECD Harmonized

23. Particle Size

Not Reported Not Reported

Not Reported

Not Reported

Template:

Passage

Distribution

Mean Size Passage

Additional Passage Details

HERO ID: 6872531

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EXTR	Δι	"	111	1	N

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, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; UICC sample; fiber (solid); NR Notes: UICC anthophyllite fibers
Method Type, Particle, Distribution, and Particle Size	other; other; Not Reported; Not Reported
Geometric Standard Deviation	Not Reported
Mean	Not Reported
Standard Deviation Mean	Not Reported
Remarks	For samples with no centrifugation, 2.5 and 25.0 min centrifugation the best fit geometric mean standard deviation were 0.5, 0.4 and 0.4 um and modal diameter = 0.238, 0.359 and 0.323 um, respectively.
Page Number	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	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 (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.

Study Citation: Patitsas, A. J. (1988). Size characterization of asbestos fibers using the Rayleigh-Debye-Gans theory. Journal of Colloid and Interface Science 122(1):15-

23. Particle Size **OECD Harmonized**

Template: HERO ID:

6872531

		EVALUATION		
Domain	Metric	Rating	Comments	
Overall Quality Determination		High		

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

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:

EXTRACTION					
Parameter	Data				
Aerodynamic Value	0.1 um - 0.5 um				
CASRN and Test Material	Not Reported; Asbestos				
Confidentiality, Type, and Guideline	None; Experimental; Nuclepore filters sam	ples and SEM ana	analysis and Individual fibers were identified by energy dispersive X-ray analysis		
Solvent, Reactivity, Storage, and Stability	None; NR; NR; NR				
Radiolabel, Source, State, and Purity	NR; Air samples; NR; NR Notes: NR				
Method Type, Particle, Distribution, and Particle Size	microscopic examination; primary particle	; other; Not Report	oorted		
Geometric Standard Deviation	0.09 -				
Mean	Not Reported				
Standard Deviation Mean	Not Reported				
Remarks	fibers (GMF)	.0 um (S.d. 2.0, rar	range 1.7-9.5um); MEAN SIZE VALUES OF EMITTED FIBERS (GMF); total mineral		
Page Number	Not Reported				
Passage	Not Reported				
Mean Size Passage	Not Reported				
Distribution	Not Reported				
Additional Passage Details	Not Reported				
		EVALUATION	 DN		
Domain	Metric	Rating	Comments		
Domain 1: Substance					
Matria 1.	Danragantativanaga	Lligh	Data are managed on actimated for the applicat chamical substance		

			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 Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

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.

Template:

Particle Size

HERO ID: 380

EVALUATION Domain Metric Rating Comments

Overall Quality Determination High

11(1):1-40. Particle Size

OECD Harmonized

Template:

HERO ID: 2073705

FXTR	ACTION

Parameter	Data		
Aerodynamic Value	0.01 um - 0.5 um		
CASRN and Test Material	1332-21-4; amosite		
Confidentiality, Type, and Guideline	None; Experimental; None, sampling fibrous particles in ambient air and asbestos fibers was made by electron microprobe analysis		
Solvent, Reactivity, Storage, and Stability	NA; NR; NR		
Radiolabel, Source, State, and Purity	NR; asbestos clouds and urban and non-urban ambient air; solid fiber; NR Notes: NR		
Method Type, Particle, Distribution, and Particle	microscopic examination; primary particle; other; Not Reported		
Size Geometric Standard Deviation	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	e			
	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	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	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 Medium

Study Citation: 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.

OECD Harmonized Template:

Particle Size

EXTR	11	ודר	\mathbf{O}	N

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, 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		
Size Geometric Standard Deviation	Not Reported		
Mean	Not Reported		
Standard Deviation Mean	Not Reported		
Remarks	Very fine fiber fraction: representative mean length 1.17 μ m (\pm 0.47), mean fiber diameter 0.23 μ m (\pm 0.07), aspect ratio = 5.40. Lengths \leq 1 μ m = 48.3%, lengths \leq 3 μ m = 99%, diameters \leq 0.1 μ m = 2.1%, diameters \leq 0.5 μ m = 99%. Aspect ratios \leq 3 = 6.2%, aspect ratios \leq 30 = 100%. Fine fiber fraction: representative mean length 2.52 μ m (\pm 1.44), mean fiber diameter 0.47 μ m (\pm 0.17), aspect ratio = 5.29. Lengths \leq 3 μ m = 72.1%, lengths \leq 10 μ m = 100%, diameters \leq 0.5 μ m = 66.4%, diameters \leq 1.0 μ 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.	
Domain 2: Test Reliabili	ty				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.	

Study Citation: 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.

OECD Harmonized
Template:

Particle Size

HERO ID: 6867217

EVALUATION

High

Domain Metric Rating Comments

Overall Quality Determination

Study Citation:	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.
OECD Harmonized	Particle Size

OECD Harmonized Template:

	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, Storage, 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				
Size	Not Demont J				
Geometric Standard Deviation	Not Reported				
Mean	Not Reported				
Standard Deviation Mean	Not Reported Virgo for the forest and approximate the second of the sec				
Remarks	Very fine fiber fraction: representative mean length 1.11 μ m (\pm 0.58), mean fiber diameter 0.13 μ m (\pm 0.04), aspect ratio = 8.90. Lengths \leq 1 μ m = 58.1%, lengths \leq 3 μ m = 99%, diameters \leq 0.1 μ m = 33.2%, diameters \leq 0.5 μ m = 100%. Aspect ratios \leq 3 = 0.5%, aspect ratios \leq 30 = 100%.				
	Fine fiber fraction: representative mean length 1.42 μ m (\pm 0.83), mean fiber diameter 0.16 μ m (\pm 0.04), aspect ratio = 9.18. Lengths \leq 3 μ m =				
	95.1%, lengths $< 10 \mu m = 100\%$, diameters $< 0.5 \mu m = 100\%$, diameters $< 1.0 \mu m = NA$. Aspect ratios $< 5 = 17.3\%$, aspect ratios $< 50 = 99\%$.				
Page Number	Not Reported				
Passage	Not Reported				
Mean Size Passage	Not Reported				
Distribution	Not Reported				
Additional Passage Details	Not Reported				

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

Study Citation:	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.
OECD Harmonized	Particle Size

OECD Harmonized Template:

FXTR	Δ	CTION	

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, Storage, 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 Size	microscopic examination; other; Not Reported; Not Reported			
Geometric Standard Deviation	Not Reported			
Mean	Not Reported			
Standard Deviation Mean	Not Reported			
Remarks	Very fine fiber fraction: representative mean length 1.35 μ m (\pm 0.83), mean fiber diameter 0.21 μ m (\pm 0.12), aspect ratio = 6.75. Lengths \leq 1 μ m = 46.1%, lengths \leq 3 μ m = 97.3%, diameters \leq 0.1 μ m = 2.1%, diameters \leq 0.5 μ m = 100%. Aspect ratios \leq 3 = 0.8%, aspect ratios \leq 30 = 100%. Fine fiber fraction: representative mean length 1.39 μ m (\pm 0.89), mean fiber diameter 0.23 μ m (\pm 0.06), aspect ratio = 6.98. Lengths \leq 3 μ m = 93.4%, lengths \leq 10 μ m = 100%, diameters \leq 0.5 μ m = 99%, diameters \leq 1.0 μ 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			

			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			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

Study Citation: OECD Harmonized	Timbrell, V. (1982 Particle Size). Deposition and retention of fibres in	the human lung	The annals of occupational hygiene, Vol. 26, no. 1-4 26(1-4):347-369.
Template:	Turriere Size			
HERO ID:	29927			
			EXTRACTIO	ON .
Parameter		Data		
Aerodynamic Value		0.44 and 3.8 μm (mine), 0.52 and 4.8 μm	(mill), 0.70 and 1	0 μm (bagging) -
CASRN and Test Material		17068-78-9; Anthophyllite		
Confidentiality, Type, and G		None; Experimental; NA		
Solvent, Reactivity, Storage,		NA; NR; NR; NR		
Radiolabel, Source, State, and		NA; Mine, mill, and bagging area dust sa		
Method Type, Particle, Dist	ribution, and Particle	determination of fibre length and diamete	er distributions; ag	gregate; counted distribution; Not Reported
Size Geometric Standard Deviati	on	2.16 and 2.74 (mine), 1.93 and 2.42 (mill). 2.26 and 2.94 (I	hagging) -
Mean		Not Reported	,, 2.20 tille 215 i (c	
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 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 Kenduni	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
	monie 5.	(Method Objectivity)	111511	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.
D				
Domain 3: Other	Matria 5	Detales	NT/A	
	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:	Timbrell, V., Grittiths, D. M., Pooley, F. D. (1971). Possible Biological Importance of Fibre Diameters of South African Amphiboles. Nature 232(5305):55-
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OECD Harmonized

56. Particle Size

Template: HERO ID: 3097547

	ACCITANT	
EXIK	ACTION	

	EXTRACTION
Parameter	Data
Aerodynamic Value	North-western Cape mines: Mean fiber diameter: 0.073 μm; Mean aerodynamic diameter: 0.09 - 0.8 μm. Transvaal mines: Mean fiber diameter: 0.212 μm; Mean aerodynamic diameter: 0.2 – 2.5 μm
CASRN and Test Material	12001-28-4; Crocidolite
Confidentiality, Type, and Guideline	None; Experimental; None
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NA; Mines in north-western Cape and Transvaal, South Africa; Solid; NR
Method Type, Particle, Distribution, and Particle Size	determination of fibre length and diameter distributions; other; Not Reported
Geometric Standard Deviation	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				
N	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
N	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliability				
N	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.
N	Metric 4:	Reliability/Analytical Method	Medium	Analytical details are missing.
Domain 3: Other				
N	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
N	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Continued on next 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-

56. Particle Size **OECD Harmonized**

Template:

HERO ID:

3097547

		EVALUATION		
Domain	Metric	Rating	Comments	
Overall Quality De	termination	Medium		

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

Additional Passage Details

56. Particle Size

Template:

HERO ID: 3097547

Parameter	Data
Aerodynamic Value	Mean fiber diameter: $0.243 \mu m$ -
CASRN and Test Material	12172-73-5; Amosite
Confidentiality, Type, and Guideline	None; Experimental; None
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NA; Mines in Transvaal, South Africa; Solid; NR
Method Type, Particle, Distribution, and Particle	determination of fibre length and diameter distributions; other; other; Not Reported
Size	W.B I
Geometric Standard Deviation	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

			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 que 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 Quality Determination

Not Reported

Medium

Study Citation:	U.S. EPA, (2014).		amphibole asbestos: In			grated Risk Information System
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(IRIS).

OECD Harmonized

Particle Size

Not Reported

Not Reported Not Reported

Template:

Mean Size Passage Distribution

Additional Passage Details

HERO ID: 3827272

EXTRACTION

Parameter	Data
Aerodynamic Value	Not Reported
CASRN and Test Material	1318-09-8; Libby amphibole
Confidentiality, Type, and Guideline	Not Reported; Not Reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Method Type, Particle, Distribution, and Particle	other; primary particle; counted distribution; Not Reported
Size Geometric Standard Deviation	Not Reported
Mean	=0.1 (width); <1 (length) - =1.0 (width); >/=100 (length) µm
Standard Deviation Mean	not reported
Remarks	cumulative particle-size-distribution frequencies of LA fibers (aspect ratio ≥3:1) in in Libby ore Grade 3, expanded Libby ore Grade 3, and ambient air samples collected in Libby
Page Number	Not Reported
Passage	Not Reported

			EVALUATIO1	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	Medium	The analytical method is non-standard but is expected to be appropriate OR 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.

Study Citation: U.S. EPA, (2014). Toxicological review of libby amphibole asbestos: In support of summary information on the Integrated Risk Information System

(IRIS). Particle Size

OECD Harmonized Template: HERO ID:

3827272

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

Overall Quality Determination High

^{*} 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). Particle size characterization of water-elutriated libby amphibole 2000 and RTI international amosite.

Template:

HERO ID: 3975014

Particle Size

EXTR	ACT	rt <i>c</i>	N
	AU		,,,

	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, Storage, 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, Distribution, and Particle	microscopic examination; primary particle; other; Not Reported			
Size Geometric Standard Deviation	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 µm (length) and 0.24358 to 1.32475 (width) Non-Fiber (particles with aspect ratio $<$ 3) sample sizes ranged from 0.21973 to 3.09938 µm (length) and 0.0998251 to 2.59266 µm (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 feature	
Domain 2: Test Reliabili	ty				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.	

Continued on next page ...

Study Citation: OECD Harmonized USGS, (2009). Particle size characterization of water-elutriated libby amphibole 2000 and RTI international amosite.

OECD Harmonized Template:

HERO ID: 3975014

Particle Size

EVALUATION

Domain Metric Rating Comments

Overall Quality Determination High

Stu	dy Citation:
OE	CD Harmonized
	_

USGS, (2009). Particle size characterization of water-elutriated libby amphibole 2000 and RTI international amosite. Particle Size

Template:

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, Storage, 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, Distribution, and Particle	microscopic examination; primary particle; other; Not Reported
Size Geometric Standard Deviation	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 μm (length) and 0.018519 to 1.33806 (width) Non-Fiber (particles with aspect ratio <3) sample sizes ranged from 0.20633 to 2.39866 μm (length) and 0.121707 to 1.7627 μm (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	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

Study Citation: USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.

OECD Harmonized

Particle Size

Template:

Mean

Standard Deviation Mean

HERO ID: 3975020

EVTD	ACTION
CAIN	ACTION

Parameter	Data
Aerodynamic Value	Not Reported
CASRN and Test Material	12001-29-5; Chrysotile
Confidentiality, Type, and Guideline	None; Experimental; None
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; Solid, fibers; NR Notes: NR
Method Type, Particle, Distribution, and Particle	other; primary particle; Not Reported; Not Reported
Size Geometric Standard Deviation	Not Reported

Not Reported Surface area = $15 - 30 \text{ m}^2/\text{g}$, measured by BET nitrogen adsorption. Remarks Page Number Not Reported

Not Reported

Not Reported Passage 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 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 Relial	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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 ...

Study Citation: USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses. Particle Size

OECD Harmonized Template:

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Dete	rmination	High	

^{*} Related References: No citations reported.

Study Citation:	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses
OECD Harmonized	Particle Size

Template:

$\mathbf{E}\mathbf{X}'$	ΓRΑ	CT	ON

Parameter	Data
Aerodynamic Value	Not Reported
CASRN and Test Material	12001-28-4; Crocidolite
Confidentiality, Type, and Guideline	None; Experimental; None
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; Solid, fibers; NR Notes: NR
Method Type, Particle, Distribution, and Particle	other; primary particle; Not Reported; Not Reported
Size Geometric Standard Deviation	Not Reported
Mean	Not Reported
Standard Deviation Mean	Not Reported
Remarks	Surface area = $1.8 - 9 \text{ m}^2/\text{g}$
Page Number	Not Reported
Passage	Not Reported
Mean Size Passage	Not Reported
Distribution	Not Reported
Additional Passage Details	Not Reported
	EVALUATION

Domain 1: Substance Metric 1: Metric 2: Domain 2: Test Reliability Metric 3:	Metric Representativeness Appropriateness Reliability/Unbiased	Rating High N/A Medium	Comments Data are measured for the subject chemical substance. Rating of this factor is not applicable to this kind of information.
Metric 1: Metric 2: Domain 2: Test Reliability	Appropriateness	N/A	· ·
Metric 2: Domain 2: Test Reliability	Appropriateness	N/A	· ·
Domain 2: Test Reliability	** *		Rating of this factor is not applicable to this kind of information.
•	Reliability/Unbiased	Madium	
Metric 3:	Reliability/Unbiased	Madina	
		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.

Study Citation: OECD Harmonized	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses. Particle Size
Template:	

HERO ID: 3975020

		EXTRACTION
Parameter	Data	

Aerodynamic Value

CASRN and Test Material

Confidentiality, Type, and Guideline

Solvent, Reactivity, Storage, and Stability

Not Reported

12172-73-5; Amosite

None; Experimental; None

NR; NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; Solid, fibers; NR Notes: NR

Method Type, Particle, Distribution, and Particle other; primary particle; Not Reported; Not Reported

Size

Geometric Standard Deviation Not Reported
Mean Not Reported
Standard Deviation Mean Not Reported

Remarks Surface area = $1.3 - 5.5 \text{ m}^2/\text{g}$

Page NumberNot ReportedPassageNot ReportedMean Size PassageNot ReportedDistributionNot ReportedAdditional Passage DetailsNot 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 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 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.

Study Citation:	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses
OECD Harmonized	Particle Size

Template:

EXTRACTION			
Parameter	Data		
Aerodynamic Value	Not Reported		
CASRN and Test Material	12001-29-5; Chrysotile		
Confidentiality, Type, and Guideline	None; Experimental; None		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR		
Radiolabel, Source, State, and Purity	NR; NR; Solid, fibers; NR Notes: NR		
Method Type, Particle, Distribution, and Particle	Not Reported; primary particle; Not Reported; Not Reported		
Size Geometric Standard Deviation	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		
	EVALUATION		

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

^{*} Related References: No citations reported.

Study Citation:
OECD Harmonized

Virta, R. L., Segreti, J. M. (1987). A model for predicting crocidolite fiber size distributions. Environmental Research 44(1):148-160.

OECD Harmonized Template:

HEDO ID: 3584086

Particle Size

HERO ID:	3584086			
			EXTRACTIO	N
Parameter		Data		
Aerodynamic Value		0.02 um (width) - 0.29 um (width)		
CASRN and Test Materia		12001-28-4; Crocidolite		
Confidentiality, Type, and	l 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 Note			
Method Type, Particle, D	istribution, and Particle	determination of fibre length and diamete	r distributions; otl	ner; counted distribution; Not Reported
Size Geometric Standard Devi	ation	Not Reported		
Mean	ution	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 Detail	ls	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.
D ' 2 T (D !)	*1*.			
Domain 2: Test Reliab	Metric 3:	Daliahility/Hahiasad	High	The most of the control of the first of the
	Meuric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.
	Metric 4:	(Method Objectivity) Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods, including, but not limited to
	MICHIC 4.	Kenaomity/Anarytical Method	High	OECD guidelines for physical-chemical properties or other developed standard.
				1 1 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.
Overall Quali	ity Dotommins	ntion	Цiah	
	ity Determina	111U11	High	

Study C	Citation:	Virta, R. L., Shedd, K. B., W	Vylie, A. G., Snyder, J. G. (1983).	Size and shape characteristics of amphibole asbestos (amosite) and amphibole cleavage
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fragments (actinolite, cummingtonite) collected on occupational air monitoring filters. Ann Arbor Science Publications, no. 2:633-643.

OECD Harmonized

Particle Size

Template:

Parameter

HERO ID: 3101498

EXTRACTION	

Aerodynamic Value

CASRN and Test Material

Confidentiality, Type, and Guideline

Solvent Reactivity, Storage and Stability

Not Reported: Not

Solvent, Reactivity, Storage, and Stability Not Reported; Not Reported; Not Reported

Data

Radiolabel, Source, State, 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, Distribution, and Particle microscopic examination; other; other; Not Reported

Size

Geometric Standard Deviation Not Reported
Mean Not Reported
Standard Deviation Mean Not Reported

Remarks

Airborne Mining Sample Particle Sizes: Homestake Gold Mine: # of particle = 266; mean length (μm) = 4.6 (range 0.9 - 17.5), mean width (μm) = 1.1 (range 0.3 - 4.8). Peter Mitchell Iron Mine: # of particle = 464; mean length (μm) = 5.5 (range 1.0 - 32.4), mean width (μm) = 1.2 (range 0.2 - 5.0). Charlottesville Crushed Stone: # of particle = 605; mean length (μm) = 5.3 (range 0.8 - 36.0), mean width (μm) = 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 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.
Domain 3: Other				
	Metric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
		Con	tinued on next j	page

Study Citation:	Virta, R. L., Shedd, K. B., Wylie, A. G., Snyder, J. G. (1983). Size and shape characteristics of amphibole asbestos (amosite) and amphibole cleavage			
	fragments (actinolite, cummingtonite) collected on occupational air monitoring filters. Ann Arbor Science Publications, no. 2:633-643.			

OECD Harmonized Particle Size

Template:

HERO ID: 3101498

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

Overall Quality Determination High

Study Citation:	Virta, R. L., Shedd, K. B., Wylie, A. G., Snyder, J. G. (1983). Size and shape characteristics of amphibole asbestos (amosite) and amphibole cleavage
	fragments (actinolite, cummingtonite) collected on occupational air monitoring filters. Ann Arbor Science Publications, no. 2:633-643.
OECD Harmonized	Particle Size
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, Storage, and Stability	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, Distribution, and Particle	microscopic examination; other; Not Reported			
Size Geometric Standard Deviation	Not Reported			
Mean	Not Reported			
Standard Deviation Mean	Not Reported			
Remarks	Airborne Industrial Sample Particle Sizes: Shipyard: # of particle = 698; mean length (μ m) = 8.2 (range 0.9 - 93.5), mean width (μ m) = 0.4 (range 0.1 - 2.6). Electric Company: # of particle = 285; mean length (μ m) = 15.6 (range 1.3 - 181.0), mean width (μ 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	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 Reliab	oility			
	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.
	Metric 4:	(Method Objectivity) 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 ...

Study Citation: Virta, R. L., Shedd, K. B., Wylie, A. G., Snyder, J. G. (1983). Size and shape characteristics of amphibole asbestos (amosite) and amphibole cleavage

fragments (actinolite, cummingtonite) collected on occupational air monitoring filters. Ann Arbor Science Publications, no. 2:633-643.

OECD Harmonized Template:

Particle Size

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		High	

Study Citation:	Wagner, J. (2015). Analysis of serpentine polymorphs in investigations of natural occurrences of asbestos. Environmental Science: Processes & Impacts

17(5):985-996. Particle Size

OECD Harmonized

Template:

HERO ID: 3531545

EXTR	ACT	ION

Parameter	Data
Aerodynamic Value	Mean Fiber width: 42 ± 16 nm -
CASRN and Test Material	12001-29-5; Chrysotile
Confidentiality, Type, and Guideline	None; Experimental; NA
Solvent, Reactivity, Storage, and Stability	Alcohol; NR; NR; NR
Radiolabel, Source, State, and Purity	NA; California, USA; Solid; NR Notes: Samples ground with mortar and pestle in alcohol
Method Type, Particle, Distribution, and Particle Size	microscopic examination; other; Not Reported
Geometric Standard Deviation	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
2	

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance				
Met	tric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
Met	tric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliability				
Met	tric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.
Met	tric 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				
Met	tric 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
Met	tric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Continued on next page ...

Study Citation: Wagner, J. (2015). Analysis of serpentine polymorphs in investigations of natural occurrences of asbestos. Environmental Science: Processes & Impacts

17(5):985-996.

OECD Harmonized

Particle Size

Template: HERO ID:

3531545

EVALUATION				
Domain	Metric	Rating	Comments	
Overall Quality 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. Inhalation

Toxicology 20(8):733-740.

OECD Harmonized

Particle Size

Template:

HERO ID: 711568						
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 Guideline	None; Experimental; transmission	electron microscope and	d scanning transmission electron microscope with x-ray detector			
Solvent, Reactivity, Storage, and Stability	sterile water; NR; NR; NR					
Radiolabel, Source, State, and Purity Method Type, Particle, Distribution, and Particle	fraction; solid; NR Notes: Libby 6-mix into respirable and nonrespi	6-mix containing six an rable size fractions by m	complex mixture of fiber sizes and nonfibrous material in addition to the respirable size aphibole fiber types, including winchite, richterite, and tremolite; separation of Libby leans of aqueous elutriation imary particle; mass based distribution; Not Reported			
Size	ne determination of hore length and e	nameter distributions, pr	mary particle, mass based distribution, Not Reported			
Geometric Standard Deviation	Not Reported					
Mean	Not Reported					
Standard Deviation Mean	Not Reported	Not Reported				
Remarks Page Number			ngth), 0.19 µm (width), aspect ratio = 16. Surface area of elutriated fibers was 5.3 m-2 m-2 g-1 measured for crocidolite; no detectable differences in chemical composition			
Passage	Not Reported					
Mean Size Passage	Not Reported					
Distribution	Not Reported	1				
Additional Passage Details	Respirable fraction (smaller than 2	vere at or below respirat	% of the raw Libby 6-mix mass); less than 2% has aerodynamic diameters greater than ole diameters. The Libby 6-mix is a mixture of fiber sizes and nonfibrous material and			
		EVALUATIO	on .			
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.			

			EVALUATIO	N
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	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Relia	ability			
	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

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. Inhalation

Toxicology 20(8):733-740.

OECD Harmonized

Particle Size

Template: HERO ID:

711568

DomainMetricRatingCommentsMetric 5:DatabasesN/ARating of this factor is not applicable to this kind of information.				EVALUATIO	N
	Domain		Metric	Rating	Comments
		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.

Overall Quality Determination High

Study Citation: Wu, L., Ortiz, C. P., Jerolmack, D. J. (2017). Aggregation of Elongated Colloids in Water. Langmuir 33(2)

OECD Harmonized

Particle Size

Template:

EXTRACTION				
Parameter	Data			
A and demonstrated Value	10 05			
Aerodynamic Value	$1.9 \pm 0.5~\mu\mathrm{m}$ -			
CASRN and Test Material	12001-29-5; Chrysotile			
Confidentiality, Type, and Guideline	None; Experimental; None			
Solvent, Reactivity, Storage, and Stability	NA; NA; NA; NA			
Radiolabel, Source, State, and Purity	NA; El Dorado Mine, Salt River, Arizona; Solid block; > 90%			
Method Type, Particle, Distribution, and Particle	microscopic examination; primary particle; other; Not Reported			
Size	N (D)			
Geometric Standard Deviation	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	Length = $10 \pm 0.8 \ \mu \text{m}$ (up to $20 \ \mu \text{m}$)			

		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 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:		Medium	The analytical method is non-standard but is expected to be appropriate OR 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.

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:

HERO ID:

3531568

EVALUATION Domain Metric

Rating Comments

Overall Quality Determination

High

Study Citation: OECD Harmonized	ACToR, (2021) Vapor Pressure	. ACToR: Asbestos.		
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, Storag		NR; NR; NR		
Radiolabel, Source, State,		NR; NR; NR; NR Notes: NR		
Temperature	·	not reported		
System		not reported		
Standard Deviation Result	S	not reported		
Results Details		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	Reported data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabi	litv			
	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.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.
Overell Oneli	tv Dotom:	nation	Uich	
Overall Quali	ty Determi	แลนงแ	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, February 2004.

Study Citation: OECD Harmonized	Cameo Chemic Vapor Pressure	als, (2016). Chemical datasheet: asbestos	S.	
Template: HERO ID:	3981007			
			EXTRACTIO	N
Parameter		Data		
Vapor Pressure		ca. 0 mm Hg		
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		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: NR		
Temperature		Not reported		
System		Not reported		
Standard Deviation Results	S	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 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	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	tv Determi	nation	High	

^{*} Related References: NIOSH, 2016 cited but no other details available

Study Citation: OECD Harmonized	Cameo Chemic Vapor Pressure	als, (2016). Chemical datasheet: asbesto	s (blue).	
Template: HERO ID:	3981008			
			EXTRACTIO	N
Parameter		Data		
Vapor Pressure		ca. 0 - mm Hg		
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; NR		
Radiolabel, Source, State,	and Purity	NR; NR; fiber; NR Notes: NR		
Temperature		not reported		
System		not reported		
Standard Deviation Results	3	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 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	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 Quali	tv Determi	nation	High	

^{*} Related References: NIOSH, 2016 cited but no other details available

Study Citation: OECD Harmonized	(2017). PubChe Vapor Pressure	em: Crocidolite.		
Template: HERO ID:	3860486			
			EXTRACTIO	N
Parameter		Data		
Vapor Pressure		ca. 0 mm Hg		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and	Guideline	None; experimental; NR		
Solvent, Reactivity, Storag		NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR		
Temperature		NR		
System		NR		
Standard Deviation Result	S	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	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 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.

^{*} Related References: Citing OSHA Occupational Chemical DB and CAMEO Chemicals.

Study Citation:
OECD Harmonized

NIOSH, (2007). NIOSH pocket guide to chemical hazards. Vapor Pressure

Template:

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H.X.L.K	Λ	CTION

Parameter	Data
Vapor Pressure	0 - mm Hg
CASRN and Test Material	1332-21-4; chrysotile, crocidolite, or amosite
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 Notes: NR
Temperature	NR
System	NR
Standard Deviation Results	NR
Results Details	approximate value

			<b>EVALUATIO</b>	N
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	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 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	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.
Overall Qua	lity Determ	ination	High	
Over all Qua	mty Determ	mauvn	High	

3974865	Data	EXTRACTION	
	Data	EXTRACTION	
	Data	23111111011011	
	ca. 0 - mm Hg		
	1332-21-4; Asbestos		
ideline	None; Not specified; NR		
and Stability	NR; NR; NR; NR		
l Purity	NR; NR; NR; NR Notes: NR		
	NR		
	NR		
	NR		
	Approximate value.		
		EVALUATION	
	Metric	Rating	Comments
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.
,			
	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.
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.
1	Metric 1: Metric 2: Metric 3: Metric 4: Metric 5:	Metric 1: Representativeness Metric 2: Appropriateness  Metric 3: Reliability/Unbiased (Method Objectivity) Metric 4: Reliability/Analytical Method  Metric 5: Databases	Purity  NR; NR; NR; NR Notes: NR  NR  NR  NR  Approximate value.   EVALUATION  Rating  Metric 1: Representativeness High  Metric 2: Appropriateness High  Metric 3: Reliability/Unbiased (Method Objectivity)  Metric 4: Reliability/Analytical Method Medium  Metric 5: Databases Medium  Metric 6: Models  N/A

^{*} Related References: None cited.

Study Citation: OECD Harmonized	NIOSH, (2019) Vapor Pressure	. NIOSH pocket guide to chemical hazard	ds: Asbestos.				
Template:	0100020						
HERO ID:	9109830						
			EXTRACTIO	N			
Parameter		Data					
Vapor Pressure		ca 0 mm Hg					
CASRN and Test Material		1332-21-4; Actinolite, Actinolite asbesto Tremolite, Tremolite asbestos	1332-21-4; Actinolite, Actinolite asbestos, Amosite (cummingtonite-grunerite), Anthophyllite, Anthophyllite asbestos, Chrysotile, Crocidolite (Riebeckite),				
Confidentiality, Type, and	Guideline	none; not specified; not specified					
Solvent, Reactivity, Storage, and Stability		NR; NR; NR	. 1 . 1				
Radiolabel, Source, State, and Purity		NR; NR; NR Notes: Hydrated mineral silicates					
Temperature		Not Reported					
System		Not Reported					
Standard Deviation Results		Not Reported					
Results Details		approximate					
			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 2: Test Reliabil	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	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.			
				metasion in a peer reviewed/recognized database of 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.			
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			

**Overall Quality Determination** 

High

^{*} Related References: Primary reference not reported in this secondary source.

<b>Study Citation:</b>
OECD Harmonized

ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001). Water Solubility

Template:

$\mathbf{E}\mathbf{X}^{r}$	rn A		ATA T

	EXTRACTION
Parameter	Data
Water Solubility	insoluble -
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
Radiolabel, Source, State, and Purity	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 solvents; 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 weight due to loss of counter-ions, silicate structure remains intact.

			<b>EVALUATIO</b>	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 (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.

ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).

Water Solubility

Template:

EXTRACTION
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	EXTRACTION
Parameter	Data
Water Solubility	insoluble -
CASRN and Test Material	12001-28-4; crocidolite
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	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 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 weight due to loss of counter-ions, silicate structure remains intact.

Domain  Domain 1: Substance  Metric 1: Metric 2:  Domain 2: Test Reliability Metric 3:	Metric  Representativeness Appropriateness  Reliability/Unbiased	Rating High High	Data are measured or estimated for the subject chemical substance.  Measured data are consistent with the subject chemical substance structural features.
Metric 1: Metric 2:  Domain 2: Test Reliability	Appropriateness		ÿ
Metric 2:  Domain 2: Test Reliability	Appropriateness		ÿ
Domain 2: Test Reliability		High	Measured data are consistent with the subject chemical substance structural features.
3	Paljahility/Linhiased		
Metric 3:	Reliability/Unbiased		
	Kenaomity/Onorased	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.

ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).

Water Solubility

Template:

EXTRACTION
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EXTRACTION				
Parameter	Data			
Water Solubility	insoluble -			
CASRN and Test Material	12172-73-5; amosite			
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: 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 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 weight due to loss of counter-ions, silicate structure remains intact.			

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 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	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				

ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).

Template:

**Parameter** 

Water Solubility

**HERO ID:** 786664

EXTRACTION

Water Solubility insoluble -

CASRN and Test Material 14567-73-8; tremolite

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; 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 solvents.

Data

			<b>EVALUATIO</b>	N
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	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	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				

ATSDR, (2001). Toxicological profile for asbestos (Update, September 2001).

Water Solubility

Template:

<b>EXTR</b>	AC	TIC	N

Donomoton	Data
Parameter	Data
Water Solubility	insoluble -
CASRN and Test Material	17068-78-9; anthophyllite
Confidentiality, Type, and Guideline	none; not specified; not specified
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	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 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 weight due to loss of counter-ions, silicate structure remains intact.

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 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	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				

Study (	Citation:	
OFOR	TT	

(2017). PubChem: Chrysotile.

OECD Harmonized

Water Solubility

**Template:** 

**HERO ID:** 3860485

#### EXTRACTION

	EATRACTION
Parameter	Data
Water Solubility	Not Reported
CASRN and Test Material	12001-29-5; Chrysotile
Confidentiality, Type, and Guideline	none; experimental; not reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Temperature	25C
System	dissolution of chrysotile in water
pH	not reported
Results Details Method	continuous extraction
Standard Deviation Results	Not Reported
Results Details	activity product of chrysotile in water = 1E-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 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	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 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

860486			
		EXTRACTIO	N
	Data		
	insoluble in water		
eline	<i>'</i>		
	NR		
		EVALUATION	N
	Metric	Rating	Comments
letric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
letric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Ietric 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.
letric 4:	Reliability/Analytical Method	N/A	Rating of this factor is not applicable to this kind of information.
1	Ietric 2:	d Stability  NR; NR; NR; NR  NR; NR; NR; NR  NR  NR  NR  NR  NR  NR  NR  NR  NR	12001-28-4; crocidolite eline none; experimental; not reported d Stability NR; NR; NR; NR Purity NR; NR; solid; NR Notes: NR N

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

Metric 5:

Metric 6:

**Overall Quality Determination** 

Databases

Models

High

N/A

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.

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

<b>Study Citation:</b>	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.
OECD Harmonized	Water Solubility

Template:

		EXTRACTIO	N		
Parameter	Data				
Water Solubility	Not Reported				
CASRN and Test Material	12001-29-5; Chrysotile				
Confidentiality, Type, and Guideline	None; Experimental; NR				
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, and Purity	NR; NR; NR; NR Notes: NR				
Temperature	NR				
System	NR				
pH	NR				
Results Details Method	NR				
Standard Deviation Results	Not Reported				
Results Details		After prolonged exposure to water, especially at high temperatures, slow progressive leaching of metal and silicate components occurs. The brucite later of chrysotile fibers will dissolve and increase the pH of 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 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.		
		M - J:	The analytical method is unknown but is likely to be appropriate based on the data's		
Metric 4:	Reliability/Analytical Method	Medium	inclusion in a peer-reviewed/recognized database or other secondary source.		
Metric 4:  Domain 3: Other	Reliability/Analytical Method	Medium			
	Reliability/Analytical Method  Databases	N/A			

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

Study Citation: OECD Harmonized	Anonymous (19 Refractive Inde	· •	nods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.
Template:				
HERO ID:	1009583			
			EXTRACTIO	N
Parameter		Data		
Refractive Index		1.54 - 1.55		
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	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				
	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 (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 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	

HERO ID: 1009583 Table: 1 of 6

Study Citation:
<b>OECD Harmonized</b>
Template:
HERO ID:

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Refractive Index

1000583

		EXTRACTION		
Parameter	Data			
Refractive Index	1.70 - 1.71			
CASRN and Test Material	12001-28-4; crocidolite			
Confidentiality, Type, and Guideline	none; experimental; not reported			
Solvent, Reactivity, Storage, and Stability	NR; NR; NR			
Radiolabel, Source, State, and 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		
Domain	Metric	Rating	Comments	

			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 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 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	High
Overan Quanty Determination	півіп

Study Citation:
<b>OECD Harmonized</b>
Template:
TIED O ID

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Refractive Index

		EXTRACTIO	N
Parameter	Data		
Refractive Index	1.67 - 1.70		
CASRN and Test Material	12172-73-5; cummingtonite-grunerite		
Confidentiality, Type, and Guideline	none; experimental; not reported		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and Purity	None; NR; fiber; NR Notes: amosite		
Геmperature	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 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			
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.

Study Citation:	•		nods, (3rd Edition	3rd Supplement). NIOSH(NIOSH):89-127.
OECD Harmonized	Refractive Inde	X		
Template: HERO ID:	1009583			
neko id:	1009383			
			EXTRACTIO	N
Parameter		Data		
Refractive Index		1.61 - 1.63		
CASRN and Test Material		1.01 - 1.03 17068-78-9; anthophyllite		
Confidentiality, Type, and	Guidalina	none; experimental; not reported		
Solvent, Reactivity, Storage		NR; NR; NR		
Radiolabel, Source, State,		None; NR; fiber; NR		
Temperature	and I urity	Not Reported		
System		Not Reported		
Standard Deviation Results	3	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 or other 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	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 omain of Onio	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.
	3.6	36.11	37/4	

Page 3	35 of	521

N/A

High

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

Metric 6:

**Overall Quality Determination** 

Models

Study Citation:
<b>OECD Harmonized</b>
Template:

Anonymous (1989). NIOSH Manual of Analytical Methods, (3rd Edition 3rd Supplement). NIOSH(NIOSH):89-127.

Refractive Index

			EXTRACTIO	N
Parameter		Data		
Refractive Index		1.60 - 1.64		
CASRN and Test Materia	ıl	14567-73-8; tremolite		
Confidentiality, Type, and	l Guideline	none; experimental; not reported		
Solvent, Reactivity, Stora	ge, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State	, and Purity	None; NR; fiber; NR		
Temperature		Not Reported		
System		Not Reported		
Standard Deviation Resul	ts	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 or other physical/chemical properties.
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 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.

Study Citation: OECD Harmonized				
Template:				
HERO ID:	1009583			
		EXTRACTION		
Parameter		Data		
Refractive Index		1.62 - 1.68		
CASRN and Test Material		13768-00-8; actinolite		
Confidentiality, Type, and G	uideline	none; experimental; not reported		
Solvent, Reactivity, Storage	, and Stability	NR; NR; NR		
Radiolabel, Source, State, an	nd 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		

Not Reported

Parameter

			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 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	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.

Study Citation: OECD Harmonized					
Template:	Kerractive filde	X			
-	2927207				
HERO ID:	3827307				
			EXTRACTION		
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		NR; NR; NR			
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR			
Temperature	•	Not Reported			
System		Not Reported			
Standard Deviation Results	3	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 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.	

# Overall Quality Determination Medium

Databases

Models

Domain 3: Other

Metric 5:

Metric 6:

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.

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

Refractive Index

Template: HERO ID:

3827307

		EXTRACTION	
Parameter	Data		
Refractive Index	1.63		
CASRN and Test Material	77536-66-4; Actinolit		
Confidentiality, Type, and Guideline	None; Experimental; I	Not reported	
Solvent, Reactivity, Storage, and Sta	bility NR; NR; NR; NR		
Radiolabel, Source, State, and Purity	NR; NR; NR; NR		
Temperature	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			
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	Reliability/Unbiase (Method Objectivity		There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
Metric			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		N/A	Rating of this factor is not applicable to this kind of information.

**Study Citation: OECD Harmonized** Template: HERO ID:

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

Refractive Index

3827307

		EXTRACTION	
Parameter	Data	EXTRACTION	
Parameter	Data		
Refractive Index	1.50 - 1.55		
CASRN and Test Material	12001-29-5; Chrysotile		
Confidentiality, Type, and Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR		
Radiolabel, Source, State, 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		
		<b>EVALUATION</b>	
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
	(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 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.

Refractive Index

		EXTRACTION	
Parameter	Data		
Refractive Index	1.64		
CASRN and Test Material	12172-73-5; Amosite		
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		
Геmperature	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		<u> </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 Reliability			
Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
1.10010 3.	(Method Objectivity)	1.10010111	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.

Study Citation: OECD Harmonized Template:  $Badollet, M.\ S.\ (1951).\ Asbestos, a\ mineral\ of\ unparalleled\ properties.\ Transactions, Canadian\ Institute\ of\ Mining\ and\ Metallurgy\ 54:151-160.$ 

Refractive Index

Template:

<b>HERO ID:</b> 3827307			
		EXTRACTION	
Parameter	Data		
Refractive Index	1.7		
CASRN and Test Material	12001-28-4; Crocidolite		
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	Not Reported		
System	Not Reported		
Standard Deviation Results	Not Reported		
Results Details	Pleochroic		
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 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	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 Determ</b>	ination	Medium	

**Study Citation: OECD Harmonized** Template: HERO ID:

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

Refractive Index

3827307

			EXTRACTION	
Parameter		Data		
Refractive Index		1.61		
CASRN and Test Material		77536-68-6; Tremolite		
Confidentiality, Type, and Guidelin	e	None; Experimental; Not reported		
Solvent, Reactivity, Storage, and St	ability	NR; NR; NR; NR		
Radiolabel, Source, State, and Purit	ty	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				
Metr	ic 1:	Representativeness	High	Data are measured for the subject chemical substance.
Metr	ic 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Domain 2: Test Reliability				
Metr	ic 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.
Metri	ic 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				
Metr	ic 5:	Databases	N/A	Rating of this factor is not applicable to this kind of information.
Metr		Models	N/A	Rating of this factor is not applicable to this kind of information.

Study Citation:	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 Inde				
Template: HERO ID:	785518				
			EXTRACTION		
Parameter		Data			
Defending Index		170 (novellales alongerica) 171	(		
Refractive Index		ca. 1.70 (parallel to elongation) - ca. 1.71	(perpendicular to elong	ation)	
CASRN and Test Material	C(4.4)	12001-28-4; Crocidolite			
Confidentiality, Type, and C		none; not specified; not specified			
Solvent, Reactivity, Storage	-	NR; NR; NR			
Radiolabel, Source, State, a	ina Purity	NR; NR; fibers; NR Notes: NR			
Temperature		NR NR			
System Standard Deviation Results		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 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	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.	
				₩ AA	
<b>Overall Qualit</b>	ty Determi	nation	Medium		

HERO ID: 785518 Table: 1 of 5

^{*} Related References: Data also reported in HERO ID 3647242.

<b>Study Citation:</b>	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 Inde			
Template:	remuerve mae	A		
HERO ID:				
			EXTRACTION	
Parameter		Data		
Refractive Index		ca. 1.54 (parallel to elongation) - ca. 1.55	(narnandicular to alon	rection)
CASRN and Test Material		12001-29-5; Chrysotile-asbestos	(perpendicular to elong	gation)
Confidentiality, Type, and	Guidalina	none; not specified; not specified		
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,		NR; NR; fibers; NR Notes: NR		
Temperature	and I urity	not reported		
System not reported				
Standard Deviation Results	2	not reported		
Results Details not reported				
Results Details Methods not reported				
Parameter		not reported		
Domain		Metric	EVALUATION Poting	Comments
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	High	Measured data are consistent with the subject chemical substance structural features.
	Metric 2.	Appropriatelless	High	Measured data are consistent with the subject chemical substance structural reatures.
Domain 2: Test Reliabil	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				
Zomani S. Ouioi	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 Dotormi	nation	Medium	

^{*} Related References: Data also reported in HERO ID 3647242.

Study Citation:	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 Inde			
Template: HERO ID:	785518			
			EXTRACTION	
Parameter		Data		
Refractive Index		ca. 1.64-1.68 (parallel to elongation) - ca.	1.62-1.67 (perpendicul	lar to elongation)
CASRN and Test Material		77536-66-4; Actinolite	(FF	
Confidentiality, Type, and	Guideline	none; not specified; not specified		
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,	-	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		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	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	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 Quali	tv Determi	nation	Medium	

^{*} Related References: Data also reported in HERO ID 3647242.

<b>Study Citation:</b>	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 Inde			
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, and Purity		NR; NR; fibers; NR Notes: NR		
Temperature	·	not reported		
System not reported		not reported		
Standard Deviation Results	3	not reported		
Results Details		not reported		
		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	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliabil	itv			
Domain 2. Test Kellauli	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
	wieure 3.	(Method Objectivity)	Wediam	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.
	mente o.	17104015	11//1	rading of this factor is not appreade to this kind of information.
<b>Overall Qualit</b>	ty Determi	nation	Medium	

^{*} Related References: Data also reported in HERO ID 3647242.

Study Citation:	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 Inde			
Template:	Ttollwood, o lindo			
HERO ID:	785518			
			EXTRACTION	
Parameter		Data		
Refractive Index		ca. 1.60-1.62 (perpendicular to elongation	n) - ca 1 62-1 64 (paral	lel to elongation)
CASRN and Test Materia	1	77536-68-6; Tremolite	.) •u. 1.02 1.0 . (pu.u.	to trongation)
Confidentiality, Type, and		none; not specified; not specified		
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,		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 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:	(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.
Overall Quali	itv Determi	nation	Medium	

^{*} Related References: Data also reported in HERO ID 3647242.

Study Citation: OECD Harmonized	DECD Harmonized Refractive Index								
Template: HERO ID:	7924810	924810							
			EXTRACTIO	N					
Parameter		Data							
Refractive Index		1.545 - 1.553							
CASRN and Test Material		12001-29-5; Chrysotile							
Confidentiality, Type, and Guideline		None; Experimental; Not reported							
Solvent, Reactivity, Storage, and Stability		NR; NR; NR							
Radiolabel, Source, State, and Purity Temperature System		NR; NR; Solid; NR							
		Not reported							
		Not reported							
Standard Deviation Results	S	Not Reported							
Results Details		1 range for n(gamma) was 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.					

Medium

Medium

High

N/A

There is no indication that the methodology for producing the information was biased

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.

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

towards a particular product or outcome.

use OR includes references to the original sources.

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

# Overall Quality Determination High

Models

Databases

Reliability/Unbiased

(Method Objectivity)

Reliability/Analytical Method

Metric 3:

Metric 4:

Metric 5:

Metric 6:

Domain 3: Other

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

Study Citation: OECD Harmonized	Elsevier, (2021) Refractive Inde	). Reaxys: physical-chemical property data	ta for Chrysotile.					
Template: HERO ID:	7924810							
			EXTRACTIO	N				
Parameter		Data						
Refractive Index		1.547 -						
CASRN and Test Material		12001-29-5; Chrysotile						
Confidentiality, Type, and Guideline		None; Experimental; Not reported						
Solvent, Reactivity, Storag		NR; NR; NR						
Radiolabel, Source, State,	•	NR; NR; Solid; NR						
Temperature		Not reported	Not reported					
System		•	Not reported					
Standard Deviation Results		Not Reported	Not Reported					
Results Details		2 values for Ng were reported in Reaxys	2 values for Ng were reported in Reaxys; one value was measured at 422.7 nm.					
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 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 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				

#### Overall Quality Determination High

Models

Metric 6:

N/A

use OR includes references to the original sources.

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

^{*} 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

Study Citation: OECD Harmonized Template:	Elsevier, (2021 Refractive Inde	). Reaxys: physical-chemical property data x	a for Chrysotile.					
HERO ID:	7924810							
			EXTRACTIO	N				
Parameter		Data						
Refractive Index		1.542 -						
CASRN and Test Material		12001-29-5; Chrysotile						
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						
Temperature		Not reported						
System		Not reported						
Standard Deviation Results		Not Reported						
Results Details		2 values for N(p) were 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: 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 based on the data's inclusion in a peer-reviewed/recognized database or other secondary source.				

### Overall Quality Determination High

Databases

Models

Metric 5:

Metric 6:

Domain 3: Other

High

N/A

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.

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

^{*} 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

Study Citation: OECD Harmonized	Elsevier, (2021) Refractive Index	. Reaxys: physical-chemical property data	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	Guideline	None; Experimental; Not reported					
Solvent, Reactivity, Storag		NR; NR; NR					
Radiolabel, Source, State,		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					
Domain		Metric	EVALUATION Rating	N Comments			
Domain 1: Substance		Wictiic	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.			
	Wietife 2.	Прргорпасиево	1071	rating of any factor is not approache to any and 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 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. Oulei	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 Over	tr. Dotomari	mation	High				
Overall Quali	ty Determi	แลนงแ	High				

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

Study Citation: OECD Harmonized	Elsevier, (2021) Refractive Index	. Reaxys: physical-chemical property d	ata for Richterite.	
Template: HERO ID:	7924816			
-			EXTRACTIO	N
Parameter	eter Data			
Refractive Index		1.594		
CASRN and Test Material		17068-76-7; Richterite		
Confidentiality, Type, and	Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage		NR; NR; NR		
Radiolabel, Source, State, a	-	NR; NR; Solid; NR		
Temperature		Not reported		
System		Not reported		
Standard Deviation Results		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: 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				
<b></b>	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

Template: HERO ID: 7924810  Parameter  Refractive Index CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stabi Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain  Domain 1: Substance  Metric 2	Data  1.606 17068-76-7; Richterite None; Experimental; Not reported	EXTRACTIO	DN
Parameter  Refractive Index CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stabi Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability Metric 3	1.606 17068-76-7; Richterite None; Experimental; Not reported ity NR; NR; NR; NR NR; NR; Solid; NR Not reported Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		DN
Parameter  Refractive Index CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stabi Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability Metric 3	1.606 17068-76-7; Richterite None; Experimental; Not reported ity NR; NR; NR; NR NR; NR; Solid; NR Not reported Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		ON Control of the con
Refractive Index CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stabi Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability Metric 3	1.606 17068-76-7; Richterite None; Experimental; Not reported ity NR; NR; NR; NR NR; NR; Solid; NR Not reported Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		ON Control of the con
Refractive Index CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stabi Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability Metric 3	1.606 17068-76-7; Richterite None; Experimental; Not reported ity NR; NR; NR; NR NR; NR; Solid; NR Not reported Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		
CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stabi Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability Metric 3	17068-76-7; Richterite None; Experimental; Not reported NR; NR; NR; NR NR; NR; Solid; NR Not reported Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		
CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stabi Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability  Metric 3	17068-76-7; Richterite None; Experimental; Not reported NR; NR; NR; NR NR; NR; Solid; NR Not reported Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		
Solvent, Reactivity, Storage, and Stabi Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability  Metric 3	NR; NR; NR; NR NR; NR; NR; NR Not reported Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		
Solvent, Reactivity, Storage, and Stabi Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability  Metric 3	NR; NR; NR; NR NR; NR; NR; NR Not reported Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		
Radiolabel, Source, State, and Purity Temperature System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability  Metric 3	NR; NR; Solid; NR Not reported Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		
System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability  Metric 3	Not reported Not Reported n(g). 1 value reported in Reaxys. Not Reported		
System Standard Deviation Results Results Details Results Details Methods Parameter  Domain Domain 1: Substance  Metric 2  Domain 2: Test Reliability  Metric 3	Not Reported n(g). 1 value reported in Reaxys.  Not Reported		
Results Details Results Details Methods Parameter  Domain  Domain 1: Substance  Metric 2  Domain 2: Test Reliability  Metric 3	n(g). 1 value reported in Reaxys. Not Reported		
Results Details Methods Parameter  Domain  Domain 1: Substance  Metric 2  Domain 2: Test Reliability  Metric 3	Not Reported		
Domain  Domain 1: Substance  Metric 2  Metric 2  Domain 2: Test Reliability  Metric 3	1		
Domain  Domain 1: Substance  Metric 2  Metric 2  Domain 2: Test Reliability  Metric 3	Not Reported		
Domain 1: Substance  Metric 2  Metric 2  Domain 2: Test Reliability  Metric 3			
Domain 1: Substance  Metric 2  Metric 2  Domain 2: Test Reliability  Metric 3		EVALUATIO	ON .
Metric 2  Metric 2  Domain 2: Test Reliability  Metric 3	Metric	Rating	Comments
Metric 2  Domain 2: Test Reliability  Metric 3			
Domain 2: Test Reliability  Metric 3	: Representativeness	High	Data are measured for the subject chemical substance.
Metric 3	: Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
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.
		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	3.6.1.1	N/A	Rating of this factor is not applicable to this kind of information.
Overall Quality Det	: Models		·

^{*} 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

Journal 72(3):251-254.

OECD Harmonized

Refractive Index

Template:

EXTR	ACT	$\Gamma I C$	N

		EXTRACTIO	21				
Parameter	Data						
Refractive Index	1.493 - 1.562						
CASRN and Test Material 12001-29-5; Chrysotile							
Confidentiality, Type, and Guideline None; Calculation; NA; dispersion staining n			ytical method used cited as Ref. 1: Lott, P. F. (1989). Correlating dispersion staining				
		active index for asb	estos 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							
Results Details alpha = 1.493 - 1.560; gamma = 1.517 - 1.562							
Results Details Methods Not Reported							
			l + correction factor; correction factor determined from annular stop and central stop				
	colors and the wavelength the colors we	olors and the wavelength the colors were observed at.					
		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 Reliability							
Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased				
Metric 3.	(Method Objectivity)	Mediuiii	towards a particular product or outcome.				
Metric 4:	Reliability/Analytical Method	Medium	The analytical method was reported elsewhere.				
Wietrie 4.	Renability/Analytical Method	Wicdiani	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				
		8	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 Determi	ination	High					
Overall Quality Determin		mgn					

OECD Harmonized Template:

Refractive Index

		EXTRACTIO	)N	
Parameter	Data			
Refractive Index	1.654 - 1.717			
CASRN and Test Material	12001-28-4; Crocidolite			
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			
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.			
	colors and the wavelength the colors wer	le observed at.		
		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.	
D				
Domain 2: Test Reliability	5 11 1 11 m of 1 1 m	3.6.11		
Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
Metric 4:	(Method Objectivity)	Medium	towards a particular product or outcome.	
Metric 4:	Reliability/Analytical Method	Mediuiii	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	
1.1201.2		111811	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 Determi	nation	High		
Overall Quality Determin	เเลเเบเเ	High		

OECD Harmonized

Refractive Index

Template: HERO ID:

6874055

HERO ID: 6874055		EVTDACTIO	N
Parameter	Data	EXTRACTIO	N
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, 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 = 1.599 - 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.		
		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 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	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 Quality Determ	ination	High	
Overan Quanty Determ	manon	nıgıı	

OECD Harmonized Template:

Refractive Index

Data		
1.596 - 1.676		
17068-78-9; Anthophyllite		
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.		
NA; NR; NR		
NA; NIST reference material; Solid; NR Notes: NR		
NR		
Not Reported		
Not Reported		
·		
Not Reported		
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.		
	EVALUATIO	N
Metric	Rating	Comments
Representativeness	High	Data are measured for the subject chemical substance.
Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
Reliability/Analytical Method	Medium	The analytical method was reported elsewhere.
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.
Models	N/A	Rating of this factor is not applicable to this kind of information.
	17068-78-9; Anthophyllite None; Calculation; NA; dispersion stain colors to the numerical value of the refra NA; NR; NR; NR; NR; NR; NR NA; NIST reference material; Solid; NR NR Not Reported Not Reported alpha = 1.596 - 1.652; gamma = 1.615 - Not Reported Extinction: parallel; refractive index = 1 colors and the wavelength the colors were  Metric  Representativeness Appropriateness  Reliability/Unbiased (Method Objectivity) Reliability/Analytical Method  Databases	17068-78-9; Anthophyllite None; Calculation; NA; dispersion staining method. Anal colors to the numerical value of the refractive index for asb NA; NR; NR; NR; NR NA; NIST reference material; Solid; NR Notes: NR NR Not Reported Not Reported alpha = 1.596 - 1.652; gamma = 1.615 - 1.688 Not Reported Extinction: parallel; refractive index = refractive index oi colors and the wavelength the colors were observed at.  EVALUATIO Metric Rating  Representativeness High Appropriateness N/A  Reliability/Unbiased (Method Objectivity) Reliability/Analytical Method  Medium  Databases High

OECD Harmonized Template:

Refractive Index

EXTRACTION				
Parameter	Data			
Refractive Index	1.635 - 1.729			
CASRN and Test Material	12172-73-5; Amosite			
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			
Radiolabel, Source, State, and Purity	NA; NIST reference material; Solid; NR Notes: NR			
Temperature	NR			
System	Not Reported	Not Reported		
Standard Deviation Results	Not Reported	Not Reported		
Results Details	alpha = 1.635 - 1.696; gamma = 1.655 - 1.729			
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.			
		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 Reliability				
Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased	
Wedie 3.	(Method Objectivity)	Wediam	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 Determ</b>	ination	High		

OECD Harmonized Template:

Refractive Index

EXTRACTION					
Parameter	Data				
Refractive Index	1.599 - 1.688				
CASRN and Test Material	14567-73-8; Tremolite				
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 = 1.599 - 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					
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 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 Quality Determ	ination	High			

**OECD Harmonized** 

148. Refractive Index

Template:

HERO ID: 6866754

EXTRACTION			
Parameter	Data		
Refractive Index	1.493 - 1.560		
CASRN and Test Material	12001-29-5; Chrysotile		
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		
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 1.517-1.562		
Results Details Methods	Not Reported		
Parameter	Not Reported		

			<b>EVALUATIO</b>	N
Domain		Metric	Rating	Comments
Domain 1: Substance	ce			
	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 Reli	iability			
	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.

### **Overall Quality Determination** High

**OECD Harmonized** 

148. Refractive Index

Template:

		EXTRACTIO	N
Parameter	Data		
Refractive Index	1.635 - 1.696		
CASRN and Test Material	12172-73-5; Amosite		
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		
Temperature	Not reported		
System	1		nm were studied to obtain a set of correction values to assist in the determination of the
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 Reliability			
Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
	(Method Objectivity)	٥	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.
O !! O . !! D . !	•	TT' 1	
<b>Overall Quality Determ</b>	ination	High	

**OECD Harmonized** 

148. Refractive Index

Template:

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, and Stability	NR; NR; NR		
Radiolabel, Source, State, 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	refractive index range measured perpendicular to fiber length was 1.668-1.717		
Results Details Methods	Not Reported		
Parameter	Not Reported		

			<b>EVALUATIO</b>	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	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

**OECD Harmonized** 

148. Refractive Index

Template:

		EXTRACTIO	N .
Parameter	Data		
Refractive Index	1.596 - 1.652		
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		
Radiolabel, Source, State, and Purity	NR; NR; NR; NR		
Temperature	Not reported		
System	slopes of the dispersion curves at w true refractive index	avelengths of 400-700 i	nm were studied to obtain a set of correction values to assist in the determination of the
Standard Deviation Results	Not reported		
Results Details	refractive index range measured par	allel to fiber length was	s 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.
D			
Domain 2: Test Reliability			

	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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		

**OECD Harmonized** 

148. Refractive Index

**Template:** 

Domain 3: Other

<b>HERO ID:</b> 6866754			
		EXTRACTIO	N
Parameter	Data		
Refractive Index	1.599 - 1.668		
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; 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		
System .	true refractive index	ingino or 100 700 i	The state of the s
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 Reliability			
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	Medium	The analytical method is unknown but is likely to be appropriate.

Overall Quality Determination	High
Overall Quality Determination	IIIgii

Databases

Models

Metric 5:

Metric 6:

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.

**OECD Harmonized** 

148. Refractive Index

Template:

		EXTRACTIO	N
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, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, and Purity	NR; NR; NR; NR		
Temperature	Not reported		
System Standard Deviation Results	slopes of the dispersion curves at v true refractive index Not reported	vavelengths of 400-700 r	nm were studied to obtain a set of correction values to assist in the determination of the
Results Details	*	her; refractive index rang	ge measured parallel to fiber length was 1.622-1.688
Results Details Methods	Not Reported	•	
	N . D 1		
Parameter	Not Reported		
Parameter	Not Reported	EVALUATIO	N
Parameter  Domain	Not Reported  Metric	EVALUATIO Rating	N Comments
Domain	•		
	•		

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 question, 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.

Study	Citation:
OFCD	Uarmaniza

(2017). PubChem: Chrysotile.

OECD Harmonized

Refractive Index

**Template:** 

**HERO ID:** 3860485

EXTR	Δ	CT	IA	N	

Parameter	Data
Refractive Index	Not Reported
CASRN and Test Material	12001-29-5; Not Reported
Confidentiality, Type, and Guideline	Not Reported; Not Reported; Not Reported
Solvent, Reactivity, Storage, and Stability	Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, and Purity	Not Reported; Not Reported; 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

			<b>EVALUATION</b>	
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	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 Quality Determination**

## 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)

					_
Study Citation: OECD Harmonized	NLM, (2021). Pub Refractive Index	bChem: Hazardous Substance Data B	ank: Chrysotile, 12	2001-29-5.	_
Template: 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		NR; NR; NR			
Radiolabel, Source, State, a		NR; NR; Solid; NR			
Temperature	and I diffy	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 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	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 3: Other	Metric 5:	Databases	High	Data is from a publicly available and peer-reviewed database.	

**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

<b>Study Citation:</b>	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.

**OECD Harmonized** 

Refractive Index

Template:

		EXTRACTION	
Parameter	Data		
Refractive Index	1.5 - 1.54		
CASRN and Test Material	12001-29-5; Chrysotile asbesto		
Confidentiality, Type, and Guideline	None; Experimental; Not report		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR		
Radiolabel, Source, State, and Purity	No; International Union Agains	t Cancer (UICC); National Institute of Environ	mental Health Sciences (NIEHS); Globe, AZ.; NR; NR
Temperature	Not reported		
System	globe chrysotile fibers exposed water). pH of 1.2.	approx. 600 h (from figure) to simulated gas	stric juice (NaCl, pepsin (hog extract), and HCl added to distilled
Standard Deviation Results	Not reported		
Results Details	Refractive index along and perp X-ray and electron diffraction.	pendicular to the fiber axis decreased from appropriate appropriat	ox. 1.54 to 1.5 over 600 hours exposure (from figure) measured by
Results Details Methods	Not Reported		
Parameter	Not Reported		
		EVALUATION	
Domain	Metric	Rating	Comments

			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	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

verall Quality	<b>Determination</b>	Hig

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.
OECD Harmonized	Refractive Index
Template:	
HERO ID:	3582855

EXTRACTION			
Parameter	Data		
Refractive Index	1.44 - 1.485		
CASRN and Test Material	12001-29-5; Chrysotile asbestos		
Confidentiality, Type, and Guideline	None; Experimental; Not reported		
Solvent, Reactivity, Storage, 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 approx. 600 h (from figure) to 1N HCl.		
Standard Deviation Results	Not reported		
Results Details	Refractive 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.
	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 question, 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.

Page	370	of <b>521</b>	

<b>Study Citation:</b>	U.S. EPA, (2014).	Toxicological review of libby amphib	oole asbestos: In su	pport of summary information on the Integrated Risk Information System			
OECD Harmonized	(IRIS). Refractive Index						
Template:	Kenactive index						
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	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: Optical and cryst	tallographic properties	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, 1.612–1.668, 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					
			EVALUATION				
Domain		Metric	Rating	Comments			
Domain			Rating	Comments			
			Rating	Comments			
	Metric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
Domain 1: Substance	Metric 1: Metric 2:	Representativeness Appropriateness					
Domain 1: Substance	Metric 2:	•	High	Data are measured or estimated for the subject chemical substance.			
Domain 1: Substance	Metric 2:	•	High	Data are measured or estimated for the subject chemical substance.			
	Metric 2:	Appropriateness  Reliability/Unbiased (Method Objectivity)	High High	Data are measured or estimated for the subject chemical substance.  Measured data are consistent with the subject chemical substance structural features.			
Domain 1: Substance	Metric 2:	Appropriateness  Reliability/Unbiased	High High	Data are measured or estimated for the subject chemical substance.  Measured data are consistent with the subject chemical substance structural features.  There is no indication that the methodology for producing the information was biased towards a particular product or outcome.			
Domain 1: Substance	Metric 2: ity Metric 3:	Appropriateness  Reliability/Unbiased (Method Objectivity)	High High Medium	Data are measured or estimated for the subject chemical substance.  Measured data are consistent with the subject chemical substance structural features.  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			
Domain 1: Substance  Domain 2: Test Reliabil	Metric 2: ity Metric 3:	Appropriateness  Reliability/Unbiased (Method Objectivity)	High High Medium	Data are measured or estimated for the subject chemical substance.  Measured data are consistent with the subject chemical substance structural features.  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			

Medium

**Overall Quality Determination** 

Study Citation:	U.S. EPA, (2014). (IRIS).	Toxicological review of libby amphi	bole asbestos: 1	In support of summary information on the Integrated Risk Information System		
<b>OECD Harmonized</b>	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 C	Guideline	none; not specified; not specified				
Solvent, Reactivity, Storage	•	NR; NR; NR; NR				
Radiolabel, Source, State, a	nd Purity	NR; NR; NR Notes: Optical and crys	stallographic prop	erties of fibrous amphiboles associated with Libby Amphibole asbestos		
Temperature		not reported				
System		not reported				
Standard Deviation Results		not reported				
Results Details		-	1.605 - 1.624, 1.6	15; gamma = 1.638–1.639, 1.627–1.641, 1.636		
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	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 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	ntion	High			

 $^{{}^{\}star}\ Related\ References:\ www.minsocam.oeg/msa/Handbook/Richterite.PDF.;\ www.webmineral.com/data/Richterite.shtml.}$ 

<b>a</b> 599 (alpha) - = 1.655 (gamma)	EXTRACTION			
<b>a</b> 599 (alpha) - = 1.655 (gamma)	EXTRACTION			
<b>a</b> 599 (alpha) - = 1.655 (gamma)	EXTRACTION			
<b>a</b> 599 (alpha) - = 1.655 (gamma)	EXTRACTION			
599 (alpha) - = 1.655 (gamma)				
7.72 0 F 11:				
67-73-8; Tremolite				
e; not specified; not specified				
NR; NR; NR				
NR; NR; NR Notes: Optical and crys	tallographic properties	of fibrous amphiboles associated with Libby Amphibole asbestos		
reported				
reported				
reported				
$Refractive \ indices: \ alpha = 1.600 - 1.628, \ 1.604 - 1.612, \ 1.599 - 1.612, \ 1.6063; \ gamma \ 1.625 - 1.655, \ 1.627 - 1.635, \ 1.625 - 1.637, \ 1.6343$				
reported				
reported				
	EVALUATION			
Metric	Rating	Comments		
resentativeness	High	Data are measured or estimated for the subject chemical substance.		
propriateness	High	Measured data are consistent with the subject chemical substance structural features.		
iability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased		
thod Objectivity)		towards a particular product or outcome.		
ability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.		
abases	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.		
dels	N/A	Rating of this factor is not applicable to this kind of information.		
	dels			

Study Citation:		Toxicological review of libby amph	ibole 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	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, a	and Purity	NR; NR; NR; NR Notes: Optical and cry	ystallographic prop	erties of fibrous amphiboles associated with Libby Amphibole asbestos
Temperature		not reported		
System		not reported		
Standard Deviation Results		not reported		
Results Details		-	6, 1.618–1.621, 1.6	29, 1.636; gamma = 1.634–1.642, 1.634–1.637, 1.650, 1.658
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	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	Low	The analytical method is unknown and there is no indication that a reliable method was used.
Domain 3: Other				
2 smain 5. Out	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	

^{*} 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. R., Wylie, A. G., Steel, E. B., Lim, M. S. (1995). Analysis of the tremolite/actinolite series using high precision refractive index measure-

HERO ID: 6887461 Table: 1 of 1

ments. Microbeam Analysis:27-28.

OECD Harmonized Template:

Refractive Index

EXTRACTION					
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, Storage, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: tremolite-actinolite				
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 Results	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				

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	lity				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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
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Study Citation:
<b>OECD Harmonized</b>

Virta, R. L. (2004). Asbestos. 3:288-319.

Refractive Index

Template: HERO ID:

3950395

		EVED A CETO	ONT
Parameter	Data	EXTRACTIO	N .
1 at affect	Data		
Refractive Index	1.60 - 1.64		
CASRN and Test Material	14567-73-8; tremolite		
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; 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		
		<b>EVALUATIO</b>	
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 Reliability			
Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased
1.1041.0	(Method Objectivity)	1,100,10111	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 Determi	nation	High	

**Study Citation:** OECD Harmonized Virta, R. L. (2004). Asbestos. 3:288-319.

Template:

Refractive Index

EXTRACTION				
Parameter	Data			
Refractive Index	1.53 - 1.56			
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			
Radiolabel, Source, State, 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		
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 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	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 Determi	nation	High		

Study Citation:
<b>OECD Harmonized</b>
Tompleter

Virta, R. L. (2004). Asbestos. 3:288-319.

Refractive Index

Template:
HERO ID: 3859385

Parameter	Data		
D. C	1.65 1.50		
Refractive Index	1.65 - 1.72		
CASRN and Test Material	12001-28-4; crocidolite		
Confidentiality, Type, and Guideline	none; not specified; not specified		
Solvent, Reactivity, Storage, and Stability	NR; NR; NR		
Radiolabel, Source, State, and Purity	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 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	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 Determ</b>	ination	High	

**Study Citation:** OECD Harmonized Virta, R. L. (2004). Asbestos. 3:288-319.

Template:

HERO ID:

Refractive Index

3859385

		EXTRACTIO	N
Parameter	Data		
Refractive Index	1.63 - 1.73		
CASRN and Test Material	12172-73-5; amosite		
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: 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 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	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 Determi	nation	High	

Study	Citation:	Xu X M Ii Y C	Relfiore L. A. Tang I.G. (20)	18) Polarized light microsco	ope method for the determination of asbest	os fiber of textile Integrated
Stuu	Citation.	Λu, Λ. IVI., LI, I. Q	2., Demoie, L. A., Tang, J. G. (20	io). I olalized light illiciosco	pe method for the determination of aspess	os noci oi uxinc. mugiand

Ferroelectrics 188(1):136-147.

OECD Harmonized

Refractive Index

**Template:** 

Domain 3: Other

**HERO ID:** 6860096

DAZED	10	TTC	<b>T</b>
FXTR	Δ( "	116	

			EXTRACTIO	VIN	
Parameter		Data			
Refractive Index		1.641 - 1.677			
CASRN and Test Materia	1				
		77536-66-4; Actinolite			
Confidentiality, Type, and		None; Experimental; NA			
Solvent, Reactivity, Storag		NA; NR; NR	1.rmp 1.1		
	abel, Source, State, and 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 Result	ts	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 Reliabi	ility				
	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.	

# Overall Quality Determination High

Models

Databases

Metric 5:

Metric 6:

High

N/A

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.

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

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 Ferroelectrics 188(1):136-147.
OECD Harmonized	Refractive Index
Template:	
HERO ID:	6860096

		EXTRACTIO	ON .
Parameter	Data		
Refractive Index	1.683 - 1.700		
CASRN and Test Material	77536-67-5; Anthophyllite		
Confidentiality, Type, and Guideline	None; Experimental; NA		
Solvent, Reactivity, Storage, and Stability	NA; NR; NR; NR		
Radiolabel, Source, State, and Purity	NA; Health and Safety Laboratory, UK as	nd KTR laborator	y, South Korea; Solid; NR Notes: Asbestos-standard sample
Temperature	NR		
System	LV100 polarizing microscope and refract	ive 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 Reliability			
Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
	(Method Objectivity)	2	tion, and the methodology's objective is clear.

<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	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.
Domain 3: Other				
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.
Domain 2: Test Relia	•			
	Metric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
	Metric 1.	Representativeness	I II gii	Data are incasured for the subject chemical substance.

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	Ferroelectrics 188(1):136-147. Refractive Index
Template:	
HERO ID:	6860096

EXTRACTION			
Parameter	Data		
Refractive Index	1.537 - 1.554		
CASRN and Test Material	12001-29-5; Chrysotile		
Confidentiality, Type, and Guideline	None; Experimental; NA		
Solvent, Reactivity, Storage, and Stability	NA; NR; NR; NR		
Radiolabel, Source, State, and Purity	NA; Health and Safety Laboratory, UK a	and KTR laborator	y, South Korea; Solid; NR Notes: Asbestos-standard sample
Temperature	NR		
System	LV100 polarizing microscope and refract	tive 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 Reliability			
Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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 Detern</b>	nination	High	

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
	Ferroelectrics 188(1):136-147.
OECD Harmonized	Refractive Index

OECD Harmoni Template:

		EXTRACTIO	)N
Parameter	Data	EXTRACTIO	// ·
Refractive Index	1.545 - 1.557		
CASRN and Test Material	12172-73-5; Amosite		
Confidentiality, Type, and Guideline	None; Experimental; NA		
Solvent, Reactivity, Storage, and Stability	NA; NR; NR; NR		
Radiolabel, Source, State, and Purity	NA; Health and Safety Laboratory, UK as	nd KTR laborator	y, South Korea; Solid; NR Notes: Asbestos-standard sample
Temperature	NR		
System	LV100 polarizing microscope and refract	ive 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 Reliability			
Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
wiente 3.	(Method Objectivity)	111511	tion, and the methodology's objective is clear.
Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
			· 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, 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.
mente o.		1071	Among of this factor is not approache to this kind of information.
<b>Overall Quality Determi</b>	nation	High	
Strain Quality Determin		****	

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	Ferroelectrics 188(1):136-147. Refractive Index
Template:	
HERO ID:	6860096

		EXTRACTIO	N			
Parameter	Data					
Refractive Index	1.670 - 1.675					
CASRN and Test Material	12172-73-5; Amosite					
Confidentiality, Type, and Guideline	None; Experimental; NA					
Solvent, Reactivity, Storage, and Stability	NA; NR; NR					
Radiolabel, Source, State, and Purity	NA; NR; NR; NR NA; Health and Safety Laboratory, UK and KTR laboratory, South Korea; Solid; NR Notes: Asbestos-standard sample					
Temperature	NR	ind KTK laborator	y, South Rolea, Solia, W. Poles. Assestos-standard sample			
System	LV100 polarizing microscope and refract	tive index oil				
Standard Deviation Results	Not Reported	ave mack on				
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 Reliability						
Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-			
	(Method Objectivity)	Č	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.			

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
	Ferroelectrics 188(1):136-147.
OECD Harmonized	Refractive Index
Template:	
HERO ID:	6860096

HERO ID: 68600	)96						
			EXTRACTIO	)N			
Parameter		Data					
Refractive Index		1.683 - 1.694					
CASRN and Test Material		12001-28-4; Crocidolite					
Confidentiality, Type, and Guideline		None; Experimental; NA					
Solvent, Reactivity, Storage, and Stability		NA; NR; NR					
Radiolabel, Source, State, and Purity			nd KTR laborator	y, South Korea; Solid; NR Notes: Asbestos-standard sample			
Temperature		NR	na min naoonatoi	y, South Norea, Bona, N. C. Nobestos Standard Sample			
System		LV100 polarizing microscope and refract	ive index oil				
Standard Deviation Results		Not Reported					
Results Details		Not Reported					
Results Details Methods		Not Reported					
Parameter		Not Reported					
			EVALUATIO	ON .			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
Metric	c 1:	Representativeness	High	Data are measured for the subject chemical substance.			
Metric	c 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			
Weth		(Method Objectivity)	111.511	tion, and the methodology's objective is clear.			
Metric	c 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.			
Domain 3: Other							
Matrice	c 5·	Databases	High	The information or data is from a recognized data collection/repository where data are			

	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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>Study Citation:</b>	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** Template: HERO ID:

Refractive Index

6860096

		EXTRACTIO	N			
Parameter	Data					
Refractive Index	1.680 - 1.692					
CASRN and Test Material	12001-28-4; Crocidolite					
Confidentiality, Type, and Guideline	None; Experimental; NA					
Solvent, Reactivity, Storage, and Stability	NA; NR; NR					
Radiolabel, Source, State, and 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 refract	ive 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 Reliability						
Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-			
Metric 4:	(Method Objectivity)	Lligh	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>Study Citation:</b>	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** Template: HERO ID:

Refractive Index

6860096

		EXTRACTIO	N			
Parameter	Data					
Refractive Index	1.596 - 1.654					
CASRN and Test Material	77536-67-5; Anthophyllite					
Confidentiality, Type, and Guideline	None; Experimental; NA					
Solvent, Reactivity, Storage, and Stability	NA; NR; NR					
Radiolabel, Source, State, and 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 refract	ive 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 Reliability						
Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-			
Matri- 4.	(Method Objectivity)	High	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.			

tudy 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
	Ferroelectrics 188(1):136-147.
DECD Harmonized	Refractive Index
emplate:	
IERO ID:	6860096

		EXTRACTIO	ON
Parameter	Data		
Refractive Index	1.599 - 1.620		
CASRN and Test Material	77536-68-6; Tremolite		
Confidentiality, Type, and Guideline	None; Experimental; NA		
Solvent, Reactivity, Storage, and Stability	NA; NR; NR; NR		
Radiolabel, Source, State, and Purity	NA; Health and Safety Laboratory	, UK and KTR laborator	ry, 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	ON .
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

			<b>EVALUATIO</b>	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)	High	The methodology for producing the information is designed to answer a specific question, 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</b>	Determination	High
O totall Quality	Determination	***

G. I Gt. it	W. W. M. I. W. O. D. G. L. J. T. L. G. (2010). D. I. J. W. L. J.
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
	Ferroelectrics 188(1):136-147.
OECD Harmonized	Refractive Index
Template:	
HERO ID:	6860096

			EXTRACTIO	N .
Parameter		Data	EATRACTIO	14
Refractive Index		1.622 - 1.641		
CASRN and Test Material		77536-68-6; Tremolite		
Confidentiality, Type, and C	Guideline	None; Experimental; NA		
Solvent, Reactivity, Storage		NA; NR; NR		
Radiolabel, Source, State, a			nd KTR laborator	y, South Korea; Solid; NR Notes: Asbestos-standard sample
Temperature	and I divid	NR	id 1111t incornior	y, bount 12010u, bottu, 1111 11000st 113000stoo standard sample
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				
	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 1000 1001110111	Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-
	medie 3.	(Method Objectivity)	ing.	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

Metric 6: Models	peer-reviewed by experts in the field, are broadly available to the public for review and use OR includes references to the original sources.  N/A  Rating of this factor is not applicable to this kind of information.
Overall Quality Determination	High

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
OF CD II	Ferroelectrics 188(1):136-147.

OECD Harmonized Template: HERO ID: Refractive Index

		EXTRACTIO	N
Parameter	Data		
Refractive Index	1.619 - 1.658		
CASRN and Test Material	77536-66-4; Actinolite		
Confidentiality, Type, and Guideline	None; Experimental; NA		
Solvent, Reactivity, Storage, and Stability	NA; NR; NR; NR		
Radiolabel, Source, State, and Purity	NA; Health and Safety Laboratory, UK as	nd KTR laboratory	y, South Korea; Solid; NR Notes: Asbestos-standard sample
Temperature	NR		
System	LV100 polarizing microscope and refract	ive index oil	
Standard Deviation Results	Not Reported		
Results Details	Not Reported		
Results Details Methods	Not Reported		
Parameter	Not Reported		
ъ.	M	EVALUATIO	
Domain	Metric	Rating	Comments
Domain 1: Substance	<b>.</b>	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 Reliability			
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.
Overall Quality Determ		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. Refractive Index

Template:

EXTRACTION		
Parameter	Data	
	1.05, 1.05	
Refractive Index	1.625 - 1.645	
CASRN and Test Material	12172-67-7; Actinolite	
Confidentiality, Type, and Guideline	None; Experimental; Gemological properties and mineral compositions of black nephrite from Guangxi	
Solvent, Reactivity, Storage, and Stability	NR; NR; NR	
Radiolabel, Source, State, and Purity	NR; NR; Solid; NR	
Temperature	Not reported	
System	plate samples measured using a refractometer	
Standard Deviation Results	Not reported	
Results Details	8 samples containing 65->98% actinolite	
Results Details Methods	Not Reported	
Parameter	Not Reported	

			<b>EVALUATIO</b>	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 (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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	ity Determi	ination	High	

Study Citation:
<b>OECD Harmonized</b>
Template:

 $Zhong,\,Q.,\,Liao,\,Z.\,\,T.,\,Qi,\,L.\,\,J.,\,Zhou,\,Z.\,\,Y.\,\,(2019).\,\,Black\,\,Nephrite\,\,Jade\,\,from\,\,Guangxi,\,Southern\,\,China.\,\,Gems\,\,\&\,\,Gemology\,\,55(2):198-215.$ 

Refractive Index

HERO ID:

6880237

EXTRACTION
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Parameter	Data
Refractive Index	1.647 - 1.650
CASRN and Test Material	12172-67-7; Actinolite
Confidentiality, Type, and Guideline	None; Experimental; Gemological properties and mineral compositions of black nephrite from Guangxi
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; Solid; NR
Temperature	Not reported
System	plate 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

			<b>EVALUATIO</b>	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	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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:	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 of chrysotile fiber surfa	composition
~~~~	C100001011	reame, in en, stephens, et in, among, si an, inmer, in an, ong, it in, in anaee, in all (1), ), it states of the effect of the sound neer surface t	20111posteron

on genotoxicity in vitro. Journal of Toxicology and Environmental Health, Part A: Current Issues 57(8):529-541. Nanomaterial Zeta

OECD Harmonized Template:

EXTRACTION						
Parameter		Data				
Zeta		ca_lower -0.02 V (acid treated fibers; tre	ated with 1 N HCl	for 2h) - ca_upper +0.02 V (untreated fibers) Other		
CASRN and Test Material		12001-29-5; chrysotile asbestos		/ - 11		
Confidentiality, Type, and Guideline		none; Experimental; not specified				
Solvent, Reactivity, Storage, and Stability		deionized H2O (Millipore); NR; NR; NR	3			
Radiolabel, Source, State, and Purity		_		olid; NR Notes: Intermediate-length chrysotile		
Isoelectric Value		not reported - not reported	ŕ	•		
Standard Deviation, Medius	m, and Remarks for	not reported; not reported				
Isoelectric Point						
Method Type, Sampling, and		other; not reported; not reported				
Instruments and Measureme	nts Reproduced	Zeta-Meter ZM-80; not reported				
Standard Deviation		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 Reliabilit	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	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 Quality	v Determina	ation	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. Jo
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Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering 49(6):617-624.

OECD Harmonized Template:

Nanomaterial Zeta

EXTRACTION				
Data				
+21.5 mV/cm - Other				
12172-67-7; Actinolite				
None; Experimental; Not Reported				
NR; NR; NR				
NA; VWR Int., Randor, PA, USA; Solid; NR Notes: Sample passed through a < 63 um stainless steel sieve and fine fraction retained for analysis				
Not Reported				
Not Reported; Not Reported; Not Reported				
land Nan al Nan al				
electrophoresis; Not Reported; Not Reported				
Zeta Meter Model 3.0+; Mean of 5 samples				
Not Reported				
NR; NR				
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 (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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: Light, W. G., Wei, E. T. (1977). Surface charge and hemolytic activity of asbestos. Environmental Research 13(1):135-145.

OECD Harmonized

Nanomaterial Zeta

Template:

HERO ID: 3084540

EXTRACTION				
Parameter	Data			
-				
Zeta	$+40.5 - +52.5 \mathrm{mV}$			
CASRN and Test Material	12001-29-5; Chrysotile			
Confidentiality, Type, and Guideline	None; Experimental; NA			
Solvent, Reactivity, Storage, 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, Medium, and Remarks for Isoelectric Point	Not Reported; Not Reported			
Method Type, Sampling, and 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			
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			

EVALUATION				
Domain		Metric	Rating	Comments
Domain 1: Substance	2			
	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	ability			
	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				
2 cinam c. Guiei	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

Continued on next page ...

... continued from previous page

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

EVALUATION

Rating Domain Metric Comments

Study Citation:
OECD Harmonized

Light, W. G., Wei, E. T. (1977). Surface charge and hemolytic activity of asbestos. Environmental Research 13(1):135-145.

Template:

Results Details

Nanomaterial Zeta

Not Reported

EXTRACTION				
Parameter	Data			
Zeta	-54.0 - mV			
CASRN and Test Material	17068-78-9; Anthophyllite			
Confidentiality, Type, and Guideline	None; Experimental; NA			
Solvent, Reactivity, Storage, 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, Medium, and Remarks for Isoelectric Point	Not Reported; Not Reported; Not Reported			
Method Type, Sampling, and 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			
pH and Medium	7.4; 100 mL distilled water with DPPC added, pH adjusted with HCl or NaOH.			

			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.

Study Citation: Light, W. G., Wei, E. T. (1977). Surface charge and hemolytic activity of asbestos. Environmental Research 13(1):135-145.

Nanomaterial Zeta

Template:

EXTRACTION				
Parameter	Data			
Zeta	-50.5 - mV			
CASRN and Test Material	12001-28-4; Crocidolite			
Confidentiality, Type, and Guideline	None; Experimental; NA			
Solvent, Reactivity, Storage, 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, Medium, and Remarks for Isoelectric Point	Not Reported; Not Reported; Not Reported			
Method Type, Sampling, and 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			
pH and Medium	7.4; 100 mL distilled water with DPPC added, pH adjusted with HCl or NaOH.			
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 Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

Light, W. G., Wei, E. T. (1977). Surface charge and hemolytic activity of asbestos. Environmental Research 13(1):135-145.

Template:

Nanomaterial Zeta

EXTRACTION		
Parameter	Data	
Zeta	-58.5 - mV	
CASRN and Test Material	12172-73-5; Amosite	
Confidentiality, Type, and Guideline	None; Experimental; NA	
Solvent, Reactivity, Storage, 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, Medium, and Remarks for Isoelectric Point	Not Reported; Not Reported	
Method Type, Sampling, and 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	
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 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, including, but not limited to OECD guidelines for physical-chemical properties or other developed standard.
				OLCD guidennes for physical-enemical properties of 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.

Light, W. G., Wei, E. T. (1977). Surface charge and asbestos toxicity. Nature 265(5594):537-539. Nanomaterial Zeta

Template:

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 Guideline	none; Experimental; not reported		
Solvent, Reactivity, Storage, 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, Medium, 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.		

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 (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

Light, W. G., Wei, E. T. (1977). Surface charge and asbestos toxicity. Nature 265(5594):537-539. Nanomaterial Zeta

Template:

EXTR	AC'	TIO	N

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, Storage, 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, Medium, 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.

			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 (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

Study Citation:
OECD Harmonized

NIH, (2016). Report on carcinogens: Asbestos. Nanomaterial Zeta

Template:

HERO ID: 3982328

EXTRACTION	

Parameter		Data					
Zeta		Not specified - Not specified					
CASRN and Test Material		1332-21-4; chrysotile					
Confidentiality, Type, and Guideline		none; Not specified; Not Reported					
Solvent, Reactivity, Storage, and Stability		NR; NR; NR; NR					
Radiolabel, Source, State, and I	Purity	NR; occurs naturally; solid; NR Notes: NR					
Isoelectric Value		Not specified - Not specified					
Standard Deviation, Medium, Isoelectric Point		Not specified; Not specified; Not specified					
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					
		E	VALUATIO	N			
Domain		Metric	Rating	Comments			
Domain 1: Substance							
M	letric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.			
N	letric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.			
Domain 2: Test Reliability							
M	letric 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.			
M	letric 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							
M	letric 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.			
V	letric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.			

Overall Quality Determination

High

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

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

Materials 276:469-479. Nanomaterial Zeta

OECD Harmonized Template:

	EXTRACTION
Parameter	Data
Zeta	Zeta potential (mV) of short fibers in Gambles solution at 37°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°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 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; 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 ± 3 m2/g, fiber length = 11 ± 1 µm; long fiber samples: surface area = 0.66 ± 2 m2/g, fiber length = 78 ± 1 µm (determined using SEM)
Isoelectric Value	Not reported - Not reported
Standard Deviation, Medium, and Remarks for	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 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 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

Domain		Metric	Rating	Comments
		Wictric	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	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 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.

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

OECD Harmonized

Materials 276:469-479. Nanomaterial Zeta

Template:

HERO ID: 3086336

EXTRACTION

Parameter	Data
Zeta	Zeta potential (mV) of long fibers in water at 37°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°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°C : $+4(\pm 2)$, $-4(\pm 3)$, $-8(\pm 3)$, $-8(\pm 3)$, $-8(\pm 3)$, $-13(\pm 2)$, $-18(\pm 5)$ 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°C : $-9(\pm 6)$, $-12(\pm 3)$, $-16(\pm 3)$, $-14(\pm 5)$, $-20(\pm 2)$, $-19(\pm 4)$, $-18(\pm 2)$, $-16(\pm 5)$, $-22(\pm 4)$, $-20(\pm 5)$, $-20(\pm 4)$, 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 Guideline	none; Experimental; Non-guideline
Solvent, Reactivity, Storage, and Stability	double distilled water or Gamble's solution (concentration 0.1 wt%); NR; NR; NR
Radiolabel, Source, State, and 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+ 0.11 Al 0.02 Fe3+ 0.01)6.07Si4.03O10(OH)7.66 Notes: Short fiber samples: surface area = 42 ± 1 m2/g, fiber length = 5 ± 2 µm; long fiber samples: surface area = 29 ± 1 m2/g, fiber length = 99 ± 5 µm (determined using SEM)
Isoelectric Value	Not reported - Not reported
Standard Deviation, Medium, and Remarks for Isoelectric Point	Not reported; Not reported
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 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; 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 Reliab	oility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

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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

OECD Harmonized Materials 276:469-479. Nanomaterial Zeta

Template:

		EVALUATION		
Domain	Metric	Rating	Comments	
Overall Quality Determination		High		

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

OECD Harmonized

Materials 276:469-479. Nanomaterial Zeta

Template:

	EXTRACTION
Parameter	Data
Zeta	Zeta potential (mV) of short fibers in water at 37° C: $-16(\pm 3)$, $-31(\pm 5)$, $-34(\pm 5)$, $-38(\pm 6)$, $-34(\pm 4)$, $-36(\pm 5)$, $-37(\pm 4)$, $-39(\pm 7)$, $-37(\pm 4)$, $-37(\pm 5)$, $-39(\pm 5)$, 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: $-20(\pm 4)$, $-23(\pm 4)$, 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 Guideline	none; Experimental; Non-guideline
Solvent, Reactivity, Storage, 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(Si7.84Al0.02)7.86O21.36(OH)2.64 Notes: Short fiber samples: surface area = 16.1 ± 6 m2/g, fiber length = 6 ± 1 µm; long fiber samples: surface area = 11.5 ± 4 m2/g, fiber length = 30 ± 3 µm (determined using SEM)
Isoelectric Value	Not reported - Not reported
Standard Deviation, Medium, and Remarks for	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 (±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; 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 = $-26(\pm 5)$.

			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 Reliability	y			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

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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

OECD Harmonized Materials 276:469-479. Nanomaterial Zeta

Template:

HERO ID: 3086336

EVALUATION

Domain Metric Rating Comments

Overall Quality Determination High

OECD Harmonized

Materials 276:469-479. Nanomaterial Zeta

Template:

	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 =
CASRN and Test Material	$-20(\pm 4)$. 77536-67-5; Anthophyllite
Confidentiality, Type, and 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; 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 ± 5 m2/g, fiber length = 17 ± 2 µm; long fiber samples: surface area = 4.4 ± 2 m2/g, fiber length = 95 ± 9 µm (determined using SEM)
Isoelectric Value	Not reported - Not reported
Standard Deviation, Medium, and Remarks for Isoelectric Point	Not reported; Not reported
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 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

			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	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

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

OECD Harmonized

Materials 276:469-479. Nanomaterial Zeta

Template:

	EXTRACTION
Parameter	Data
Zeta	Zeta potential (mV) of short fibers in Gambles solution at 37°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°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 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; 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 ± 9 m2/g, fiber length = 10 ± 5 µm; long fiber samples: surface area = 45 ± 2 m2/g, fiber length = 160 ± 9 µm (determined using SEM)
Isoelectric Value	Not reported - Not reported
Standard Deviation, Medium, and Remarks for	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

			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	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 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.

Study Citation: Pollastri	Gualtieri, A. F., Gualtieri, M. L., Hanuskova, M., Cavallo, A., Gaudino, G. (2014). The zeta potential of mineral fibres. Journal of Hazardous
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OECD Harmonized

Materials 276:469-479. Nanomaterial Zeta

Template:

	EXTRACTION
Parameter	Data
Zeta	Zeta potential (mV) of short fibers in Gambles solution at 37°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°C : $+1(\pm 5)$, $-12(\pm 5)$, $-18(\pm 5)$, $-23(\pm 4)$, $-19(\pm 5)$, $-25(\pm 4)$, $-16(\pm 2)$, $-16(\pm 2)$, $-17(\pm 2)$, $-17(\pm 2)$, $-17(\pm 2)$, $-18(\pm 2)$, $-18(\pm 2)$, 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 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; 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 ± 2 m2/g, fiber length = 6 ± 1 μ m; long fiber samples: surface area = 24.8 ± 9 m2/g, fiber length = 65 ± 3 μ m (determined using SEM)
Isoelectric Value	Not reported - Not reported
Standard Deviation, Medium, and Remarks for	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 (±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

Metric 1: Metric 2: Domain 2: Test Reliability	Metric Representativeness Appropriateness	Rating High High	Comments Data are measured for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features.
Metric 2: Domain 2: Test Reliability	•		· ·
Metric 2: Domain 2: Test Reliability	•		· ·
Domain 2: Test Reliability	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
, and the second			
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.

OECD Harmonized

Materials 276:469-479. Nanomaterial Zeta

Template:

	EXTRACTION
Parameter	Data
Zeta	Zeta potential (mV) of short fibers in Gambles solution at 37°C : $-16(4)$, $-19(\pm 4)$, $-21(\pm 4)$, $-21(\pm 4)$, $-21(\pm 4)$, $-21(\pm 4)$, $-25(\pm 3)$, $-21(\pm 7)$, $-14(\pm 7)$, $-15(\pm 6)$, 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°C : $-13(\pm 3)$, $-23(\pm 8)$, and $-24(\pm 5)$, at pH 4.5, 5.5, and 7.0, respectively.
CASRN and Test Material	12172-73-5; Amosite
Confidentiality, Type, and 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 ± 3 m2/g, fiber length = 7 ± 2 μ m; long fiber samples: surface area = 3.9 ± 1 m2/g, fiber length = 125 ± 9 μ 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 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 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

Metric 1: Metric 2: Domain 2: Test Reliability	Metric Representativeness Appropriateness	Rating High High	Comments Data are measured for the subject chemical substance. Measured data are consistent with the subject chemical substance structural features.
Metric 2: Domain 2: Test Reliability	•		· ·
Metric 2: Domain 2: Test Reliability	•		· ·
Domain 2: Test Reliability	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
, and the second			
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.

Schiller, J. E., Payne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibers. Nanomaterial Zeta

Template:

ity marks for al Details uced	Not Reported Not Reported; Not Reported; Not Reported electrophoresis; zeta potential was calcula Zeta Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water	Against Canter; (ed ated using the He xially to the elect	Origin: Finland; Not Reported; ACS reagent grade Imholtz-Smoluchowski equation; microelectrophoresis tric field were timed, and the average electrophoretic mobility was calculated from the h: ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
marks for	77536-67-5; anthophyllite asbestos none; Experimental; none distilled water; Not Reported; Not Report Not Reported; UICC International Union Not Reported Not Reported; Not Reported; Not Reported; Not Reported; Electrophoresis; zeta potential was calculated a Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	Against Canter; (ed ated using the He xially to the elect	Origin: Finland; Not Reported; ACS reagent grade Imholtz-Smoluchowski equation; microelectrophoresis tric field were timed, and the average electrophoretic mobility was calculated from the h: ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
marks for	77536-67-5; anthophyllite asbestos none; Experimental; none distilled water; Not Reported; Not Report Not Reported; UICC International Union Not Reported Not Reported; Not Reported; Not Reported; Not Reported; Electrophoresis; zeta potential was calculated a Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	Against Canter; (ed ated using the He xially to the elect	Origin: Finland; Not Reported; ACS reagent grade Imholtz-Smoluchowski equation; microelectrophoresis tric field were timed, and the average electrophoretic mobility was calculated from the h: ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
marks for	none; Experimental; none distilled water; Not Reported; Not Report Not Reported; UICC International Union Not Reported; Not Reported; Not Reporte electrophoresis; zeta potential was calcula Zeta Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	Against Canter; (ed ated using the He xially to the elect	Origin: Finland; Not Reported; ACS reagent grade Imholtz-Smoluchowski equation; microelectrophoresis tric field were timed, and the average electrophoretic mobility was calculated from the h: ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
marks for	distilled water; Not Reported; Not Report Not Reported; UICC International Union Not Reported Not Reported; Not Reported; Not Reported electrophoresis; zeta potential was calcula Zeta Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	Against Canter; (ed ated using the He xially to the elect	Origin: Finland; Not Reported; ACS reagent grade Imholtz-Smoluchowski equation; microelectrophoresis tric field were timed, and the average electrophoretic mobility was calculated from the h: ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
marks for	Not Reported; UICC International Union Not Reported Not Reported; Not Reported; Not Reported electrophoresis; zeta potential was calcula Zeta Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	Against Canter; (ed ated using the He xially to the elect	Origin: Finland; Not Reported; ACS reagent grade Imholtz-Smoluchowski equation; microelectrophoresis tric field were timed, and the average electrophoretic mobility was calculated from the h: ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
ıl Details	Not Reported Not Reported; Not Reported; Not Reported electrophoresis; zeta potential was calcula Zeta Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	ed ated using the He xially to the elect	Imholtz-Smoluchowski equation; microelectrophoresis tric field were timed, and the average electrophoretic mobility was calculated from the h: ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
ıl Details	Not Reported; Not Reported; Not Reported electrophoresis; zeta potential was calcula Zeta Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	ated using the He xially to the elect	tric field were timed, and the average electrophoretic mobility was calculated from the the ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
ıl Details	electrophoresis; zeta potential was calcula Zeta Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	ated using the He xially to the elect	tric field were timed, and the average electrophoretic mobility was calculated from the the ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
	Zeta Meter cell; Only particles aligned a average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	xially to the elect	tric field were timed, and the average electrophoretic mobility was calculated from the the ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
uced	average velocity. Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi	nerals from grapl	h: ca40, -51, -58, -58, and -59 at pH values of 5, 6, 7, 8, and 9, respectively; zeta
	Not Reported 5-9; distilled water zeta potentials of fibrous asbestiform mi		· · · · · · · · · · · · · · · · · · ·
	5-9; distilled water zeta potentials of fibrous asbestiform mi		· · · · · · · · · · · · · · · · · · ·
	zeta potentials of fibrous asbestiform mi		· · · · · · · · · · · · · · · · · · ·
	-		· · · · · · · · · · · · · · · · · · ·
		EVALUATIO	ON .
	Metric	Rating	Comments
:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
:	Paliability/Unbiased	Uiah	The methodeless for moduling the information is designed to assess as a significant
	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.
		High	Data are obtained by accepted standard analytical methods.
•	Kenaomity/Anarytical Method	Iligii	Data are obtained by accepted standard analytical methods.
	Databases	N/A	Rating of this factor is not applicable to this kind of information.
•	Models	N/A	Rating of this factor is not applicable to this kind of information.
	:	(Method Objectivity) Reliability/Analytical Method Databases	(Method Objectivity) Reliability/Analytical Method High Databases N/A Models N/A

Schiller, J. E., Payne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibers. Nanomaterial Zeta

Template:

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		EXTRACTIO	N .			
Parameter	Data					
Zeta	ca_lower -41 - ca_upper -20 mV					
CASRN and Test Material	12001-28-4; Crocidolite					
Confidentiality, Type, and Guideline	none; Experimental; none					
Solvent, Reactivity, Storage, and Stability	distilled water; Not Reported; Not Repor					
Radiolabel, Source, State, and Purity	Not Reported; UICC International Union	Not Reported; ACS reagent grade				
Isoelectric Value	Not Reported					
Standard Deviation, Medium, and Remarks for	Not Reported; Not Reported; Not Report	ed				
Isoelectric Point Method Type, Sampling, and Additional Details	electrophoresis; zeta potential was calculated using the Helmholtz-Smoluchowski equatio		mholtz-Smoluchowski equation; microelectrophoresis			
Instruments and Measurements Reproduced	1 1		ric field were timed, and the average electrophoretic mobility was calculated from the			
0 1 15 1 1	average velocity.					
Standard Deviation	Not Reported					
pH and Medium	5-9; distilled water	1.6.1	20 22 41 40 1 41 4 11 1 65 6 7 0 10 2 1			
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 ± 1 and elongated particles = 39 ± 1 at pH 7				
	potential (III v) of blocky particles = 28±	1 and clongated pa	articles = 35±1 at p11 /			
		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.			
5						
Domain 2: Test Reliability	5 11 121 77 11	*** 1				
Metric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific ques-			
Matria 4.	(Method Objectivity)	TT: -1-	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 Determina	ation	High				
<u>-</u>						

Schiller, J. E., Payne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibers.

Template:

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Nanomaterial Zeta

	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, and Stability	distilled water; Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, and Purity	Not Reported; UICC International Union Against Canter; Origin: Africa; Not Reported; ACS reagent grade
Isoelectric Value	Not Reported
Standard Deviation, Medium, and Remarks for	Not Reported; Not Reported; Not Reported
Isoelectric Point	all the should be a should be a should be decided as the TL lab dec Constant and the should be said as the should
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: ca25, -35, -36, -50, and -55 at pH values of 5, 6, 7, 8, and 9, respectively; zeta potential (mV) of blocky particles = 24 ± 3 and elongated particles = 37 ± 2 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 Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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
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Schiller, J. E., Payne, S. L. (1980). Surface charge measurements of amphibole cleavage fragments and fibers. Nanomaterial Zeta

Template:

	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, Storage, and Stability	distilled water; 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, Medium, and Remarks for	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 (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 ± 1 and elongated particles = 35 ± 3 at pH 7 (Switzerland)

			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 Reliab	oility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

Study Citation:	USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.
OECD Harmonized	Nanomaterial Zeta

Template:

	EXTRACTION
Parameter	Data
Zeta	+13.6 - +54
CASRN and Test Material	1332-21-4; Chrysotile
Confidentiality, Type, and Guideline	None; Experimental; NR
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Isoelectric Value	NR - 11.8
Standard Deviation, Medium, and Remarks for	Not Reported; Not Reported
Isoelectric Point Method Type, Sampling, and Additional Details	Not Reported; NR; NR
Instruments and Measurements Reproduced	NR; NR
Standard Deviation	Not Reported
pH and Medium	NR; NR
Results Details	Values become negative after weathering and/or leaching.

			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	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	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: No citations reported.

Study Citation: OECD Harmonized Nanomaterial Zeta

USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.

HERO ID:

Template:

3975020

EVED ACTION

Developed	EXTRACTION
Parameter	Data
Zeta	-2040
CASRN and Test Material	12172-73-5; Amosite
Confidentiality, Type, and Guideline	None; Experimental; NR
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Isoelectric Value	NR -
Standard Deviation, Medium, and Remarks for	Not Reported; Not Reported
Isoelectric Point Method Type, Sampling, and Additional Details	Not Reported; NR; NR
Instruments and Measurements 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: 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	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: No citations reported.

USGS, (2002). Asbestos: Geology, mineralogy, mining, and uses.

Nanomaterial Zeta

Template:

Parameter	Data
Zeta	-32 -
CASRN and Test Material	12001-28-4; Crocidolite
Confidentiality, Type, and Guideline	None; Experimental; NR
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR Notes: NR
Isoelectric Value	NR -
Standard Deviation, Medium, and Remarks for	Not Reported; Not Reported
Isoelectric Point Method Type, Sampling, and Additional Details	Not Reported; NR; NR
Instruments and Measurements 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: 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 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: No citations reported.

Study Citation: Vidovic, K., Lovrecek, B., Hraste, M. (1996). Influence of surface charge on sedimentation and filtration behaviour of fibrous material. Chemica
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Biochemical Engineering Quarterly 10(1):33-38. Nanomaterial Zeta

OECD Harmonized Template:

HERO ID:

3584063

EXTRACTION	
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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, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; P-5-50; Ural Mines, Russia; fibrous solid; Grade 5Z (Asbestos Textile Institute (USA) and Quebec Asbestos Mining Association (Canada))
T 1	Notes: NA
Isoelectric Value	9 - ca_upper
Standard Deviation, Medium, and Remarks for	Not Reported; water; Not Reported
Isoelectric Point	A CONTRACT OF THE CONTRACT OF
Method Type, Sampling, and Additional Details	electrophoresis; NR; thermostated at 298K
Instruments and Measurements Reproduced	Lab instrument contained an electroosmotic cell, membrane, Pt electrode, measuring capillary, ampmeter, voltmeter, conductometer and thermo-
	stat; NA
Standard Deviation	+/-1 mV (approximate from figure)
pH and Medium	2 to 12; Water
Results Details	Approx 7.5 mV at pH 2 and -1 mV at pH 12

			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)	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.

Study Citation: Wu, L., Ortiz, C. P., Jerolmack, D. J. (2017). Aggregation of Elongated Colloids in Water. Langmuir 33(2):622-629. Nanomaterial Zeta

OECD Harmonized

Template:

HERO ID:	3531568						
_		_	EXTRACTIO	ON .			
Parameter		Data					
Zeta		ca_lower -14 - ca_upper 5.0					
CASRN and Test Materia		12001-29-5; Chrysotile					
Confidentiality, Type, and Guideline		None; Experimental; NA					
Solvent, Reactivity, Storage, and Stability		NA; NR; NR; NR					
Radiolabel, Source, State, and Purity		NA; El Dorado Mine, Salt River, Arizona; Solid block; > 90%					
Isoelectric Value		4 - 5					
Standard Deviation, Med	dium, and Remarks for		water, dispersed	by sonication, pH adjusted with HCl; Dilute acid treated values in this study lower than			
Isoelectric Point Method Type, Sampling,	and Additional Details	values reported elsewhere.	minad from alactr	ophoretic mobility using the Smoluchowski approximation.			
		Delsa Nano C; NR	iiiiieu iioiii eiecu	opnorede moonity using the smoldenowski approximation.			
Instruments and Measurements Reproduced Standard Deviation		Not Reported					
pH and Medium		1	0: 150 ppm (nomi	nal) test substance in water dispersed by sonication nH adjusted with HCl			
Results Details			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 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				
resums Demis		~7.5, and ~-14 at pH 8.0	2.2 ut p11	110 mpi 211, 217 mpi 210, 77 mpi 311, 12 mpi 307, 12 mpi			
		-					
			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 Dalish	.:11:4						
Domain 2: Test Reliab	Metric 3:	Daliahility/I Inhiasad	Hiah	The made delicence and the second sec			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology was appropriate.			
	Metric 4:	Reliability/Analytical Method	High	The analytical method was appropriate.			
	1.10010 1.	Tementy// mary treat treated	111511	The analytical medica may appropriate.			
Domain 3: Other							
	Metric 5:	Databases	High	The information or data is from a recognized data collection/repository where data are			
			C	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.			
0 110 1	D.	4.	TT. 1				
Overall Qual	ity Determina	ation	High				

Study Citation: OECD Harmonized	Elsevier, (2021) Dielectric Cons). Reaxys: physical-chemical property dastant	ta for Chrysotile.	
Template:	7024010			
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, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; Solid; NR		
Dielectric Constant		800 -		
Temperature		Not Reported		
System		Not Reported		
Results Value		Not Reported		
Results Details		at 25°C. 1 value reported 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	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 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 Quali	ty 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 Cons). Reaxys: physical-chemical property dat tant	a for Tremolite.	
Template: HERO ID:	7924814			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		14567-73-8; Tremolite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR		
Radiolabel, Source, State,		NR; NR; Solid; NR		
Dielectric Constant		7.03		
Temperature		20 deg C		
System		Not Reported		
Results Value		Not Reported		
Results Details		powdered tremolite at 20°C; 1 value repo	orted in Reaxys.; m	onohydrated. Collected using the search term 'tremolite' 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 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 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.

N/A

High

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

Metric 6:

Overall Quality Determination

Models

^{*} 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
	C '

Society. Section A: Inorganic, Physical, and Theoretical Chemistry 1966:79-81.

OECD Harmonized Template:

Other Properties

HERO ID: 3827309

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline None; Experimental; Not Reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; Johns Manville Research Centre from Jeffery Mine, Quebec, CAN.; NR; NR

Results Value Surface area: 13.5 - 22.4 m²/g @ 25°C

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 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	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

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 Society. Section A: Inorganic, Physical, and Theoretical Chemistry 1966:79-81.			
OECD Harmonized	Other Propertie		inistry 1700.77 0	••
Template:	1			
HERO ID:	3827309			
		E	XTRACTION	
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	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	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 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

Study Citation: Addison, W. E., Neal, G. H., Sharp, J. H., White, A. D. (1966). Amphiboles. Part IV. Surface properties of amosite and crocidolist			
	Society. Section A: Inorganic, Physical, and Theoretical Chemistry 1966:79-81.		
OECD Harmonized			
Template:			
HERO ID:	3827309		

	LAII	KACII
Parameter	Data	
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; 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	

			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	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 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
Jveran Quanty	Determination	Mediuiii

Study Citation:
OECD Harmonized
m 1 /

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

EVTD	ACTION
CAIN	ACTION

Parameter	Data			
CASRN and Test Material	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			
Results Value	Tensile strength: 110 - 620 Mpa (16 000 - 90 000 lb /in ^2)			

Results DetailsNot ReportedResults RemarksNot Reported

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	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	ability			
	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	3.5	(Method Objectivity)	3.6.11	1
	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

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

DECD Harmonized Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile

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 Value Optical properties: Biaxial positive parallel extinction

Results Details Not Reported
Results Remarks Not Reported

Metric 1:	Metric Representativeness	Rating	Comments
	Representativeness	TT' 1	
	Representativeness	TT' 1	
f	Trepresentati. eness	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 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.
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.
Л	letric 4:	(Method Objectivity) Reliability/Analytical Method Metric 5: Databases	(Method Objectivity) Reliability/Analytical Method Medium Metric 5: Databases N/A

Overall Quality Determination Medium

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

ECD Harmonized Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter Data

CASRN and Test Material 12172-73-5; Amosite

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 Value Optical properties: Biaxial positive parallel 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.
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 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

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

Template: HERO ID: Other Properties

3827307

EXTRACTION

Parameter Data

12001-28-4; Crocidolite CASRN and Test Material

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 Value Optical properties: Biaxial \pm extinction 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 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 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

 $Badollet, M.\ S.\ (1951).\ Asbestos, a\ mineral\ of\ unparalleled\ properties.\ Transactions, Canadian\ Institute\ of\ Mining\ and\ Metallurgy\ 54:151-160.$

CD Harmonized Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile

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 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 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 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

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

D Harmonized Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter Data

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; NR

Results Value Tensile strength: 690 - 2100 Mpa (100,000 - 300,000 lb./in.^2)

Results Details Not Reported
Results Remarks Not Reported

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	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	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	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

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

ced Other Properties

Template:

HERO ID: 3827307

EXTRA	ACTION

Parameter Data

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 Radiolabel, Source, State, and Purity NR; NR; NR; NR

Results Value Essential composition: Mg silicate with iron

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 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 Quality Determination

 $Badollet, M.\ S.\ (1951).\ Asbestos, a\ mineral\ of\ unparalleled\ properties.\ Transactions, Canadian\ Institute\ of\ Mining\ and\ Metallurgy\ 54:151-160.$

ed Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter Data

CASRN and Test Material 77536-66-4; Actinolite

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 Value Essential composition: Ca, Mg, Fe silicate 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 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 Quality Determination

Study Citation: OECD Harmonized	Badollet, M. S. Other Propertie		ed properties. Tr	ansactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template:	2827207			
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-67-5; Anthophyllite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR		
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	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	N/A	Rating of this factor is not applicable to this kind of information.

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.

Databases

Models

Metric 5:

Metric 6:

Study Citation: OECD Harmonized		•	ed properties. Tr	ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template:	Other Properties	S		
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data	EATRACTIO	
CACDN 1T (M () 1		7752((())) (') ''		
CASRN and Test Material	C: 4-1:	77536-66-4; Actinolite		
Confidentiality, Type, and C Solvent, Reactivity, Storage		None; Experimental; Not Reported NR; NR; NR; NR		
Radiolabel, Source, State, a	•	NR; NR; NR; NR NR; NR; NR		
Results Value	and Furity	Luster: silky		
Results Details		Not Reported		
Results Remarks		Not Reported		
Trobuilo Tromaino		Tiou 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	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 Qualit	ty Determi	nation	High	

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

Template: **HERO ID:**

Parameter

3827307

EXTRACTION

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
Radiolabel, Source, State, and Purity	NR; NR; NR; NR
Results Value	Mohs hardness: 5.5 - 6.0
Results Details	Not Reported
Results Remarks	Not Reported

Data

			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	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 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.

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

Parameter

HERO ID: 3827307

EXTRACTION

CASRN and Test Material	77536-66-4; Actinolite
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 Value	Mohs hardness: 6.0+/-
Results Details	Not Reported
Results Remarks	Not Reported

Data

			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	oility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biase 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.

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

Template: **HERO ID:**

Parameter

Results Remarks

3827307

EXTRACTION

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
Radiolabel, Source, State, and Purity	NR; NR; NR; NR
Results Value	Specific gravity: 2.85 - 3.1
Results Details	Not Reported

Data

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 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	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

Parameter

HERO ID: 3827307

EXTRA	CTION
LAIKA	CHON

CASRN and Test Material	77536-66-4; Actinolite
Confidentiality, Type, and Guideline	None; Experimental; Not Reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR; NR

Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity Results Value

NR; NR; NR; NR Specific gravity: 3.0 - 3.2

Data

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 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 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

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

EXTRACTION

Parameter Data

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 Radiolabel, Source, State, and Purity NR; NR; NR; NR

Results Value Optical properties: Biaxial positive extinction 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 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 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

 $Badollet, M.\ S.\ (1951).\ Asbestos, a\ mineral\ of\ unparalleled\ properties.\ Transactions, Canadian\ Institute\ of\ Mining\ and\ Metallurgy\ 54:151-160.$

ECD Harmonized Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter Data

CASRN and Test Material 77536-66-4; Actinolite

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 Value Optical properties: Biaxial negative extinction 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 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 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

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

Parameter Data

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 Radiolabel, Source, State, and Purity NR; NR; NR; NR

 $\label{eq:results} \mbox{Results Value} \qquad \qquad \mbox{Tensile strength:} \leq 30 \mbox{ Mpa} \ (\leq 4{,}000 \mbox{ lb./in.^2})$

Results Details Not Reported
Results Remarks Not Reported

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	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	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	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

 $Badollet, M.\ S.\ (1951).\ Asbestos, a\ mineral\ of\ unparalleled\ properties.\ Transactions, Canadian\ Institute\ of\ Mining\ and\ Metallurgy\ 54:151-160.$

nized Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter Data

CASRN and Test Material 77536-66-4; Actinolite

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 NR; NR

Results Value Tensile strength: $\leq 7 \text{ Mpa} (\leq 1,000 \text{ lb./in.}^2)$

Results Details Not Reported
Results Remarks Not Reported

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	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	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	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

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

DECD Harmonized Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile

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 Value Essential composition: Mg silicate with some water

Results Details Not Reported
Results Remarks Not Reported

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	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	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	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 Template:

Parameter

 $Badollet, M.\ S.\ (1951).\ Asbestos, a\ mineral\ of\ unparalleled\ properties.\ Transactions, Canadian\ Institute\ of\ Mining\ and\ Metallurgy\ 54:151-160.$

ECD Harmonized Other Properties

HERO ID: 3827307

EXTRACTION

CASRN and Test Material 12172-73-5; Amosite

Confidentiality, Type, and Guideline None; Experimental; Not Reported

Data

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR Radiolabel, Source, State, and 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 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 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

 $Badollet, M.\ S.\ (1951).\ Asbestos, a\ mineral\ of\ unparalleled\ properties.\ Transactions, Canadian\ Institute\ of\ Mining\ and\ Metallurgy\ 54:151-160.$

Other Properties

Template:

HERO ID: 3827307

Parameter Data

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; NR

Results Value Essential composition: Na, Fe silicate with 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 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 Quality Determination

Study Citation: OECD Harmonized	Badollet, M. S. Other Propertie	- · · · · · · · · · · · · · · · · · · ·	ed properties. Tr	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	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		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 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	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.

High

Overall Quality Determination

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.

OECD Harmonized	Other Propertie	es		, c
Template: HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12172-73-5; Amosite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR		
Results Value		Luster: vitreous to somewhat 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 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	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 Quality Determination	High
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Study Citation: OECD Harmonized	Badollet, M. S. Other Propertie	-	ed properties. Ti	ransactions, Canadian Institute of Mining and Metallurgy 54:151-160.
Template: HERO ID:	3827307			
пекотр:	3627307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-28-4; Crocidolite		
Confidentiality, Type, and		None; Experimental; Not Reported		
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,	•	NR; NR; NR		
Results Value		Luster: silky to dull		
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	litv			
	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.
				6

N/A

High

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

Metric 6:

Overall Quality Determination

Models

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

Parameter

3827307 **HERO ID:**

EXTRACTION

CASRN and Test Material	12001-29-5; Chrysotile
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 Value	Mohs hardness: 2.5 - 4.0

Data

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 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 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

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

Other Properties

Data

Template:

Parameter

HERO ID: 3827307

EXTRACTION

CASRN and Test Material 12172-73-5; Amosite
Confidentiality, Type, and Guideline None; Experimental; Not Reported
Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity

Radiolabel, Source, State, 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 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 Quality Determination

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

Template: **HERO ID:**

Parameter

3827307

EXTRACTION

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; NR
Results Value	Mohs hardness: 4.0
Results Details	Not Reported
Results Remarks	Not Reported

Data

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	ility				
	Metric 3:	Reliability/Unbiased (Method Objectivity)	Medium	There is no indication that the methodology for producing the information was biase 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

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

Other Properties

Template:

Parameter

HERO ID: 3827307

CASRN and Test Material 12001-29-5; Chrysotile Confidentiality, Type, and Guideline None; Experimental; Not Reported

Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity

NR; NR; NR; NR

NR; NR; NR; NR

Data

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 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 Quality Determination

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:

Parameter

3827307

CASRN and Test Material 12172-73-5; Amosite

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 Value

Specific gravity: 3.1 - 3.25

Data

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 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 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 Qual	ity Determ	ination	Medium	

Overall Quality Determination

Mealum

Study Citation:						
OECD Harmonized						
Tamplata:						

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160. Other Properties

Template:

3827307 **HERO ID:**

EVT	RAC'	$TT \cap$	T.T
LAI	KAC	\mathbf{n}	I

Parameter	Data	
CASRN and Test Material	12001-28-4; Crocidolite	
Confidentiality, Type, and Guideline	None; Experimental; Not Reported	
Solvent, Reactivity, Storage, and Stability	NR; NR; NR	
Radiolabel, Source, State, and Purity	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 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 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

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

EXTRA	CT	ION
1221 111	101	1011

Parameter 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; NR Radiolabel, Source, State, and Purity NR; NR; NR; NR

Results Value Essential composition: Ca, Mg silicate with some water

Results Details Not Reported
Results Remarks Not Reported

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	ce			
	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 Reli	iability			
	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.

Study Citation: OECD Harmonized				
Template:	nonized Other Properties			
HERO ID:	3827307			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-68-6; Tremolite		
Confidentiality, Type, and	Guideline	None; Experimental; Not Reported		
Solvent, Reactivity, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR		
Results Value		Luster: silky		
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	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	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 Quali	ty Determi	nation	High	

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

3827307 **HERO ID:**

EXTRACTION

Parameter	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; NR	
Radiolabel, Source, State, and Purity	NR; NR; NR; NR	
Results Value	Mohs hardness: 5.5	
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 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 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

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

Template:

Parameter

3827307 **HERO ID:**

EXTR	ACTI	ON

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 Value	Specific gravity: 2.9 - 3.2
Results Details	Not Reported
Results Remarks	Not Reported

Data

			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	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
	3.6	(Method Objectivity)	3.6.11	1 1
	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.
				* **

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

ECD Harmonized Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter 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; NR Radiolabel, Source, State, and Purity NR; NR; NR; NR

Results Value Optical properties: Biaxial negative extinction 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 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 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

Badollet, M. S. (1951). Asbestos, a mineral of unparalleled properties. Transactions, Canadian Institute of Mining and Metallurgy 54:151-160.

ECD Harmonized Other Properties

Template:

HERO ID: 3827307

EXTRACTION

Parameter 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; NR Radiolabel, Source, State, and Purity NR; NR; NR; NR

Results Value Tensile strength: 7 - 60 Mpa (1,000 - 8,000 lb./in.^2)

Results Details Not Reported
Results Remarks Not Reported

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 1: Substance	ce			
	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 Reli	iability			
	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 Quality Determination

Study C	itation:	Bartosiewicz, L. (1973). Improved Techniques of Identification and Determination of Airborne Asbestos. American Industrial Hygiene Association Journal	al
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34(6):252-259.

OECD Harmonized

Other Properties

Template:

HERO ID: 3099513

Confidentiality, Type, and Guideline

FYTD	ACTION
LAIN	ACTION

Parameter	Data
CASRN and Test Material	1332-21-4; Asbestos

None; Experimental; Not Reported

Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity
NR; NR; NR; NR; NR

Results Value 2-15 um size, 12.7% particles ≥5 μm, average particle size 2.9 μm

Results Details Not Reported
Results Remarks Not Reported

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	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	ability			
	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.

Overall Quality Determination 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

Template: 3083760

HERO ID:

FYTDACTION

	EXTRACTION
Parameter	Data
CASRN and Test Material	12001-29-5; Chrysotile
Confidentiality, Type, and Guideline	None; Experimental; Not Reported
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; NR
Results Value	Fiber size, median true diameter: 0.06 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 Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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 Qual	lity Determ	ination	High	

Hwang, C. Y. (1983). Size and shape of airborne asbestos fibres in mines and mills. British Journal of Industrial Medicine 40(3):273-279.

Template:

Parameter

HERO ID: 3083760

EXTRACTION

CASRN and Test Material 12172-73-5; Amosite

Other Properties

Confidentiality, Type, and Guideline None; Experimental; Not Reported

Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity
NR; NR; NR; NR
NR; NR; NR

Results Value Fiber size, median true diameter: 0.26 µm

Data

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 Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

Hwang, C. Y. (1983). Size and shape of airborne asbestos fibres in mines and mills. British Journal of Industrial Medicine 40(3):273-279.

Template:

HERO ID: 3083760

CASRN and Test Material
Confidentiality, Type, and Guideline
Solvent, Reactivity, Storage, and Stability
Radiolabel, Source, State, and Purity
Nationality
Nationa

Other Properties

Results Value Fiber size, median true diameter: 0.09 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 Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

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

Template:

Parameter

HERO ID: 3083760

EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile

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 Value Fiber size, median true length: 0.55 µm

Data

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 Reliabi	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.

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

Template:

Parameter

HERO ID: 3083760

EXTRACTION

CASRN and Test Material 12172-73-5; Amosite

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 Value Fiber size, median true length: 2.53 µm

Data

Results Details Not Reported Results Remarks Not Reported

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance	e			
	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	ability			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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			High	Rating of this factor is not applicable to this kind of information.

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

Template:

HERO ID: 3083760

EXTRACTION

Parameter Data

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; NR

Results Value Fiber size, median true length: 1.16 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 Reliab	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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:	IARC, (2012). anthophyllite).	ARC Monographs on the evaluation of c	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	Other Propertie	es		
Template:				
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		77536-68-6; tremolite		
Confidentiality, Type, and	Guideline	none; not specified; None		
Solvent, Reactivity, Storag		NR; NR; NR		
Radiolabel, Source, State,	-	None; NR; solid; NR		
Results Value	.	acid resistant		
Results Details		Not Reported		
Results Remarks		Not Reported		
			EVALUATIO	NI
Domain		Metric	Rating	Comments
Domain 1: Substance		Wettre	Rumg	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			
Domain 2. 105t 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	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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of	carcinogenic risks	s to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Other Propertie			
Template:	Other I ropertie			
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, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	None; NR; solid; NR		
Results Value		resistance to acids: none		
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 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	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.

 $^{^{\}star}$ Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of c	arcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Other Propertie	8		
Template:	Outer 1 repetite			
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data	- Extraction	
CASRN and Test Material		77536-67-5; anthophyllite		
Confidentiality, Type, and	Guideline	none; not specified; None		
Solvent, Reactivity, Storag		NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	None; NR; solid; NR		
Results Value		resistance to acids: very		
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 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	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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of c	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Other Propertie	es.		
Template:	o uner rroperne			
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, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	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	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	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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of c	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Other Propertie	es.		
Template:	o uner rroperne			
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, Storag	e, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	None; NR; solid; NR		
Results Value		resistance to acids: 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	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	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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:		ARC Monographs on the evaluation of o	carcinogenic risks	to humans: Asbestos (Chrysotile, amosite, crocidolite, tremolite, actinolite, and
OECD Harmonized	anthophyllite). Other Properties	S		
Template:	other Properties	5		
HERO ID:	3970851			
			EXTRACTIO	N
Parameter		Data		
CASRN and Test Material		12001-29-5; chrysotile		
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		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 (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.

^{*} Related References: From ATSDR (2001), USGS (2001), HSE (2005), NTP (2005)

Study Citation:	Lahondère, D., Cagnard, F., Wille, G., Duron, J., Misseri, M. (2018). TEM and FESEM characterization of asbestife	orm and non-asbestiform actinolite
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fibers in hydrothermally altered dolerites (France). Environmental Earth Sciences 77(10):385.

OECD Harmonized Template:

Other Properties

HERO ID: 6865913

EXTR	ΔCT	'ION

Parameter Data

CASRN and Test Material 12172-67-7; Actinolite

Confidentiality, Type, and Guideline None; Experimental; Diameter and aspect ratio; NA

Solvent, Reactivity, Storage, and Stability NA; NR; NR; NR

Radiolabel, Source, State, and Purity NA; Saint-Salvi de Carcaves Unit and Frehel Unit in France; Solid; NR

Results Value Aspect ratio: 20:1 - 100:1, width < 0.5 μ m Results Details Analytical method: SEM-EDS-TEM-EDS

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 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	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.

Overall Quality Determination High

Study	Citation:	
OFOR		

(2017). PubChem: Chrysotile.

OECD Harmonized

Other Properties

Template:

HERO ID: 3860485

EXTR	Δ	CT	IO	N	

	EATRACTION
Parameter	Data
CASRN and Test Material	12001-29-5; Not Reported
Confidentiality, Type, and Guideline	Not Reported; Not Reported
Solvent, Reactivity, Storage, and Stability	Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, and Purity	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.

		EVALUATIO	N
	Metric	Rating	Comments
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.
	Daliahility/Hahiasad	Madium	
vieure 3:	3	Medium	There is no indication that the methodology for producing the information was biased towards a particular product or outcome.
Matria 1.		Low	1 1
Menic 4.	Renability/Anarytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
			used.
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.
Determi	nation	High	
N N	Metric 2: Metric 3: Metric 4: Metric 5: Metric 6:	Metric 1: Representativeness Metric 2: Appropriateness Metric 3: Reliability/Unbiased (Method Objectivity) Metric 4: Reliability/Analytical Method Metric 5: Databases	Metric 1: Representativeness High Metric 2: Appropriateness High Metric 3: Reliability/Unbiased (Method Objectivity) Metric 4: Reliability/Analytical Method Low Metric 5: Databases High Metric 6: Models N/A

^{*} 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.)

Study Citation:	(20
OECD Harmonized	Oth
Tompleter	

017). PubChem: Chrysotile.

ther 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, and Stability	Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, and Purity	Not Reported; Not Reported; Not Reported
Results Value	Thermal decomposition is accomplished through dehydroxylation and dehydration mechanisms. Under dynamic heating conditions, dehydroxylation occurs at 650 deg C and formation of fastering and silica is apparent at 81 deg C.
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 (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 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	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.

^{*} Related References: Source: USEPA, Office of Drinking Water; Criteria Document (Draft): Asbestos p./1-8 (1980) (not a primary source)

Study Citation:	(2017). PubChe	•			
OECD Harmonized	Other Propertie	S			
Template:					
HERO ID:	3860485				
			EXTRACTIO	N	
Parameter		Data			
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 Value		Completely decomposed in concentrated	Potassium hydrox	ide.	
Results Details		at 200C			
Results Remarks		The resistance of the asbestos fibers to attack by reagents other than acid as excellent up to temperatures of approximately 100 deg C w deterioration observed at higher temperatures.			
			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	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 OR includes references to the original sources.	

High

Overall Quality Determination

^{*} 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:	stomach acid?.	Environmental Health Perspectives 53(No	•	otile asbestos altered by a 10-year residence in water and up to 5 days in simulated		
OECD Harmonized	Other Propertie	es				
Template:						
HERO ID:	3582855					
			EXTRACTIO	N		
Parameter		Data				
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; NR				
Radiolabel, Source, State, and Purity		No; International Union Against Cancer (UICC); National Institute of Environmental Health Sciences (NIEHS); Globe, AZ.; NR; NR				
				C 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Results Value		Zeta potential changed from positive to untreated fibers to pH 4 in 0.1N HCl trea		after exposure to simulated gastric juice. Zero point charge moved from pH 6.5 for		
Results Value Results Details				after exposure to simulated gastric juice. Zero point charge moved from pH 6.5 for		
		untreated fibers to pH 4 in 0.1N HCl trea		after exposure to simulated gastric juice. Zero point charge moved from pH 6.5 for		
Results Details Results Remarks		untreated fibers to pH 4 in 0.1N HCl trea Not Reported	ted for 5 days. EVALUATIO			
Results Details Results Remarks Domain		untreated fibers to pH 4 in 0.1N HCl trea Not Reported	ted for 5 days.			
Results Details Results Remarks Domain		untreated fibers to pH 4 in 0.1N HCl trea Not Reported Not Reported Metric	EVALUATIO Rating	N		
Results Details Results Remarks Domain	Metric 1:	untreated fibers to pH 4 in 0.1N HCl trea Not Reported Not Reported Metric Representativeness	EVALUATIO Rating	N Comments Data are measured for the subject chemical substance.		
Results Details Results Remarks	Metric 1: Metric 2:	untreated fibers to pH 4 in 0.1N HCl trea Not Reported Not Reported Metric	EVALUATIO Rating	N Comments		
Results Details Results Remarks Domain Domain 1: Substance	Metric 2:	untreated fibers to pH 4 in 0.1N HCl trea Not Reported Not Reported Metric Representativeness	EVALUATIO Rating	N Comments Data are measured for the subject chemical substance.		
Results Details Results Remarks Domain Domain 1: Substance	Metric 2:	untreated fibers to pH 4 in 0.1N HCl trea Not Reported Not Reported Metric Representativeness	EVALUATIO Rating	N Comments Data are measured for the subject chemical substance. Rating of this factor is not applicable to this kind of information. The methodology for producing the information is designed to answer a specific ques-		
Results Details Results Remarks Domain	Metric 2:	untreated fibers to pH 4 in 0.1N HCl trea Not Reported Not Reported Metric Representativeness Appropriateness	EVALUATIO Rating High N/A	N Comments Data are measured for the subject chemical substance. Rating of this factor is not applicable to this kind of information.		

Overall Quality Determination High

Databases

Models

Metric 5:

Metric 6:

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.

Study Citation: Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research

23(2):348-361.

Other Properties

Template:

OECD Harmonized

HERO ID: 3581901

FYTD	ACTION
LAIN	ACTION

Parameter Data

CASRN and Test Material 12172-73-5; Amosite

Confidentiality, Type, and Guideline None; Experimental; NA; mean diameter

Solvent, Reactivity, Storage, and Stability NA; NR; NR; NR

Radiolabel, Source, State, and Purity NA; South Africa; Solid; NR Notes: Air jet milled

Results Value Mean log width= -0.339 ± 0.229 um (width = 0.458 ± 1.69 um), log length = 1.197 ± 0.592 (length = 15.7 ± 3.91 um), mean log aspect ratio =

 $\begin{array}{c} 1.536 \pm 0.523 \\ \text{Results Details} & \text{Measured by SEM} \\ \text{Results Remarks} & \text{Not Reported} \end{array}$

			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	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 Quality Determination High

Study Citation: Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research 23(2):348-361.

OECD Harmonized

Other Properties

Template: HERO ID:

Results Remarks

3581901

EVTD	ACTION
CAIN	ACTION

Parameter	Data
CASRN and Test Material	12001-28-4; Crocidolite
Confidentiality, Type, and Guideline	None; Experimental; None; mean diameter
Solvent, Reactivity, Storage, and Stability	NA; NR; NR; NR
Radiolabel, Source, State, and Purity	NA; South Africa; Solid; NR Notes: Air jet milled
Results Value	Mean log width= -0.606 ± 0.203 um (width = 0.248 ± 1.60 um), mean log length = 0.727 ± 0.442 (length = 5.33 ± 2.77 um), mean log aspect ratio = 1.332 ± 0.426
Results Details	Measured by SEM

			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	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.

Not Reported

Study Citation: Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research

Domain 3: Other

23(2):348-361. Other Properties

OECD Harmonized	Other Properties					
Template:						
HERO ID:	3581901					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material	1	12001-29-5; Chrysotile				
Confidentiality, Type, and	Guideline	None; Experimental; None; mean diameter	er			
Solvent, Reactivity, Storag	ge, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State,	and Purity	NA; Idria, California; Solid; NR Notes: S	hort-fiber. Air cla	ssified.		
Results Value		Mean log width= -0.780 ± 0.255 um (width = 0.166 ± 1.80 um) by SEM, -1.234 ± 0.251 um (width = 0.058 ± 1.78 um) by TEM, log length = 0.002 ± 0.561 (length = 1.00 ± 3.64 um) by SEM, mean log length = 0.710 ± 0.338 (length = 5.13 ± 2.18 um) by TEM; mean log aspect ratio 1.590 ± 0.383 um by SEM and 1.236 ± 0.450 um by TEM				
		1.590 ± 0.383 um by SEM and 1.236 ± 0).450 um by TEM			
Results Details		1.590 ± 0.383 um by SEM and 1.236 ± 0 Measured by SEM and TEM).450 um by TEM			
Results Details Results Remarks		,).450 um by TEM			
		Measured by SEM and TEM	EVALUATIO			
		Measured by SEM and TEM				
Results Remarks Domain		Measured by SEM and TEM Not Reported	EVALUATIO	N		
Results Remarks Domain	Metric 1:	Measured by SEM and TEM Not Reported	EVALUATIO	N		
Results Remarks	Metric 1: Metric 2:	Measured by SEM and TEM Not Reported Metric	EVALUATIO Rating	N Comments		
Domain Domain 1: Substance	Metric 2:	Measured by SEM and TEM Not Reported Metric Representativeness	EVALUATIO Rating High	N Comments Data are measured for the subject chemical substance.		
Domain Domain 1: Substance	Metric 2:	Measured by SEM and TEM Not Reported Metric Representativeness	EVALUATIO Rating High N/A	N Comments Data are measured for the subject chemical substance.		
Results Remarks Domain	Metric 2:	Measured by SEM and TEM Not Reported Metric Representativeness Appropriateness	EVALUATIO Rating High	N Comments Data are measured for the subject chemical substance. Rating of this factor is not applicable to this kind of information.		

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.

Overall Quality Determination High

Databases

Models

Metric 5:

Metric 6:

Study Citation: Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research 23(2):348-361.

OECD Harmonized

Other Properties

Template:

HERO ID: 3581901

DVD	ACTION
P.AIK	AC.IICIN

Parameter	Data
CASRN and Test Material	12001-29-5; Chrysotile
Confidentiality, Type, and Guideline	None; Experimental; NA; mean diameter
Solvent, Reactivity, Storage, and Stability	NA; NR; NR; NR
Radiolabel, Source, State, and Purity	NA; Thetford, Quebec; Solid; NR Notes: Long-fiber. Air classified.
Results Value	Mean log width= -0.870 ± 0.255 um (width = 0.135 ± 1.80 um), mean log length = 0.651 ± 0.619 (length = 4.48 ± 4.16 um), mean log aspect ratio = 1.580 ± 0.383
Results Details	Measured by SEM
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	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	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 Quality Determination High

Study Citation: Siegrist, H. G., Wylie, A. G. (1980). CHARACTERIZING AND DISCRIMINATING THE SHAPE OF ASBESTOS PARTICLES. Environmental Research 23(2):348-361.

OECD Harmonized

Other Properties

Template:

HERO ID: 3581901

DVD	ACTION
P.AIK	AC.IICIN

Parameter	Data
CASRN and Test Material	14567-73-8; Tremolite
Confidentiality, Type, and Guideline	None; Experimental; NA; mean diameter
Solvent, Reactivity, Storage, and Stability	NA; NR; NR
Radiolabel, Source, State, and Purity	NA; St. Lawrence County, NY; Solid; NR
Results Value	$Mean log width = 0.117 \pm 0.292 \ um \ (width = 1.31 \pm 1.95 \ um), mean log length = 0.464 \pm 0.344 \ (length = 2.91 \pm 2.20), mean log aspect ratio = 1.000 \ under the contraction of t$
Results Details	0.347 ± 0.214 Measured by SEM and TEM

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 Relia	bility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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 Quality Determination High

Template: HERO ID: 3615 Parameter CASRN and Test Material Confidentiality, Type, and Guidelin Solvent, Reactivity, Storage, and St Radiolabel, Source, State, and Purit Results Value Results Details Results Remarks Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability	ne Stability	Data 12001-29-5; Chrysotile None; Experimental; None; mean length NA; NR; NR; NR NA; Personal air-monitor filters from wor mill, and open pit mine; Solid; 100% chry airborne asbestos fibers Mean log length = 0.031 – 0.597 μm; M μm; Mean width = 0.234 – 0.076 μm; M Measured by STEM with EDXA on a par	kers involved in c ysotile Notes: Sar lean log width = - ean aspect ratio = rticle-by-particle fferent occupation	construction, fiber packing, cutting sheet asbestos, and crushed stone operation, operation mples prepared according to the USPHS/NIOSH filter membrane method for evaluating $-0.630 - 1.120 \mu m$; Mean log aspect ratio = $0.942 - 1.273$; Mean length = $1.07 - 3.95 = 8.75 - 18.7$ basis and or mining settings. Log values were converted by reviewer.
Parameter CASRN and Test Material Confidentiality, Type, and Guidelin Solvent, Reactivity, Storage, and St Radiolabel, Source, State, and Purit Results Value Results Details Results Remarks Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability	ne Stability	12001-29-5; Chrysotile None; Experimental; None; mean length NA; NR; NR; NR NA; Personal air-monitor filters from wor mill, and open pit mine; Solid; 100% chry airborne asbestos fibers Mean log length = $0.031 - 0.597 \mu m$; M μm ; Mean width = $0.234 - 0.076 \mu m$; M Measured by STEM with EDXA on a par Ranges of averages of 8 samples from dif	and diameter kers involved in c ysotile Notes: Sai tean log width = tean aspect ratio = rticle-by-particle fferent occupation EVALUATIO	construction, fiber packing, cutting sheet asbestos, and crushed stone operation, operation mples prepared according to the USPHS/NIOSH filter membrane method for evaluating $-0.630 - 1.120 \mu m$; Mean log aspect ratio = $0.942 - 1.273$; Mean length = $1.07 - 3.95 = 8.75 - 18.7$ basis and or mining settings. Log values were converted by reviewer.
Parameter CASRN and Test Material Confidentiality, Type, and Guidelin Solvent, Reactivity, Storage, and St Radiolabel, Source, State, and Purit Results Value Results Details Results Remarks Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability	ne Stability	12001-29-5; Chrysotile None; Experimental; None; mean length NA; NR; NR; NR NA; Personal air-monitor filters from wor mill, and open pit mine; Solid; 100% chry airborne asbestos fibers Mean log length = $0.031 - 0.597 \mu m$; M μm ; Mean width = $0.234 - 0.076 \mu m$; M Measured by STEM with EDXA on a par Ranges of averages of 8 samples from dif	and diameter kers involved in c ysotile Notes: Sai tean log width = tean aspect ratio = rticle-by-particle fferent occupation EVALUATIO	construction, fiber packing, cutting sheet asbestos, and crushed stone operation, operation mples prepared according to the USPHS/NIOSH filter membrane method for evaluating $-0.630 - 1.120 \mu m$; Mean log aspect ratio = $0.942 - 1.273$; Mean length = $1.07 - 3.95 = 8.75 - 18.7$ basis and or mining settings. Log values were converted by reviewer.
CASRN and Test Material Confidentiality, Type, and Guidelin Solvent, Reactivity, Storage, and St Radiolabel, Source, State, and Purit Results Value Results Details Results Remarks Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability	Stability	12001-29-5; Chrysotile None; Experimental; None; mean length NA; NR; NR; NR NA; Personal air-monitor filters from wor mill, and open pit mine; Solid; 100% chry airborne asbestos fibers Mean log length = $0.031 - 0.597 \mu m$; M μm ; Mean width = $0.234 - 0.076 \mu m$; M Measured by STEM with EDXA on a par Ranges of averages of 8 samples from dif	and diameter kers involved in c ysotile Notes: Sai tean log width = tean aspect ratio = rticle-by-particle fferent occupation EVALUATIO	construction, fiber packing, cutting sheet asbestos, and crushed stone operation, operation mples prepared according to the USPHS/NIOSH filter membrane method for evaluating $-0.630 - 1.120 \mu m$; Mean log aspect ratio = $0.942 - 1.273$; Mean length = $1.07 - 3.95 = 8.75 - 18.7$ basis and or mining settings. Log values were converted by reviewer.
CASRN and Test Material Confidentiality, Type, and Guidelin Solvent, Reactivity, Storage, and St Radiolabel, Source, State, and Purit Results Value Results Details Results Remarks Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability	Stability	12001-29-5; Chrysotile None; Experimental; None; mean length NA; NR; NR; NR NA; Personal air-monitor filters from wor mill, and open pit mine; Solid; 100% chry airborne asbestos fibers Mean log length = $0.031 - 0.597 \mu m$; M μm ; Mean width = $0.234 - 0.076 \mu m$; M Measured by STEM with EDXA on a par Ranges of averages of 8 samples from dif	kers involved in c ysotile Notes: Sar lean log width = - ean aspect ratio = rticle-by-particle fferent occupation	mples prepared according to the USPHS/NIOSH filter membrane method for evaluating $-0.6301.120 \ \mu m$; Mean log aspect ratio = $0.942 - 1.273$; Mean length = $1.07 - 3.95 = 8.75 - 18.7$ basis nal or mining settings. Log values were converted by reviewer.
Confidentiality, Type, and Guidelin Solvent, Reactivity, Storage, and St Radiolabel, Source, State, and Purit Results Value Results Details Results Remarks Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability	Stability	None; Experimental; None; mean length NA; NR; NR; NR NA; Personal air-monitor filters from wor mill, and open pit mine; Solid; 100% chrairborne asbestos fibers Mean log length = 0.031 – 0.597 μm; Mμm; Mean width = 0.234 – 0.076 μm; M Measured by STEM with EDXA on a par Ranges of averages of 8 samples from different statements.	kers involved in c ysotile Notes: Sar lean log width = - ean aspect ratio = rticle-by-particle fferent occupation	mples prepared according to the USPHS/NIOSH filter membrane method for evaluating $-0.6301.120 \ \mu m$; Mean log aspect ratio = $0.942 - 1.273$; Mean length = $1.07 - 3.95 = 8.75 - 18.7$ basis nal or mining settings. Log values were converted by reviewer.
Solvent, Reactivity, Storage, and St Radiolabel, Source, State, and Purit Results Value Results Details Results Remarks Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability	Stability	None; Experimental; None; mean length NA; NR; NR; NR NA; Personal air-monitor filters from wor mill, and open pit mine; Solid; 100% chrairborne asbestos fibers Mean log length = 0.031 – 0.597 μm; Mμm; Mean width = 0.234 – 0.076 μm; M Measured by STEM with EDXA on a par Ranges of averages of 8 samples from different statements.	kers involved in c ysotile Notes: Sar lean log width = - ean aspect ratio = rticle-by-particle fferent occupation	mples prepared according to the USPHS/NIOSH filter membrane method for evaluating $-0.6301.120 \ \mu m$; Mean log aspect ratio = $0.942 - 1.273$; Mean length = $1.07 - 3.95 = 8.75 - 18.7$ basis nal or mining settings. Log values were converted by reviewer.
Solvent, Reactivity, Storage, and St Radiolabel, Source, State, and Purit Results Value Results Details Results Remarks Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability	Stability	NA; Personal air-monitor filters from wor mill, and open pit mine; Solid; 100% chryairborne asbestos fibers Mean log length = $0.031 - 0.597 \mu m$; M μm ; Mean width = $0.234 - 0.076 \mu m$; M Measured by STEM with EDXA on a par Ranges of averages of 8 samples from dif	ysotile Notes: San lean log width = - lean aspect ratio = rticle-by-particle fferent occupation	mples prepared according to the USPHS/NIOSH filter membrane method for evaluating $-0.6301.120 \ \mu m$; Mean log aspect ratio = $0.942 - 1.273$; Mean length = $1.07 - 3.95 = 8.75 - 18.7$ basis nal or mining settings. Log values were converted by reviewer.
Radiolabel, Source, State, and Purit Results Value Results Details Results Remarks Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability	-	mill, and open pit mine; Solid; 100% chryairborne asbestos fibers Mean log length = $0.031 - 0.597 \mu m$; M μm ; Mean width = $0.234 - 0.076 \mu m$; M Measured by STEM with EDXA on a par Ranges of averages of 8 samples from dif	ysotile Notes: San lean log width = - lean aspect ratio = rticle-by-particle fferent occupation	mples prepared according to the USPHS/NIOSH filter membrane method for evaluating $-0.6301.120 \ \mu m$; Mean log aspect ratio = $0.942 - 1.273$; Mean length = $1.07 - 3.95 = 8.75 - 18.7$ basis nal or mining settings. Log values were converted by reviewer.
Domain 1: Substance Metri Metri Domain 2: Test Reliability		μ m; Mean width = 0.234 – 0.076 μ m; M Measured by STEM with EDXA on a par Ranges of averages of 8 samples from dif	ean aspect ratio = rticle-by-particle fferent occupation	= 8.75 – 18.7 basis nal or mining settings. Log values were converted by reviewer.
Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability		Measured by STEM with EDXA on a par Ranges of averages of 8 samples from dif	rticle-by-particle fferent occupation EVALUATIO	basis nal or mining settings. Log values were converted by reviewer. ON
Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability		Ranges of averages of 8 samples from dif	fferent occupation EVALUATIO	nal or mining settings. Log values were converted by reviewer.
Domain Domain 1: Substance Metri Metri Domain 2: Test Reliability			EVALUATIO	ON .
Domain 1: Substance Metri Metri Domain 2: Test Reliability		Matria		
Domain 1: Substance Metri Metri Domain 2: Test Reliability		Matria	D 4	
Metri Metri Domain 2: Test Reliability		Metric	Rating	Comments
Metri Domain 2: Test Reliability				
Domain 2: Test Reliability		Representativeness	High	Data are measured for the subject chemical substance.
	ric 2:	Appropriateness	N/A	Rating of this factor is not applicable to this kind of information.
_				
Wietr	ric 3:	Reliability/Unbiased	High	The methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.
Metri	ric 4:	(Method Objectivity) Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.
Wicu	1.	2.011.011.017.11.117.11.011.11.11.011.00	111511	Data are scanned of accepted standard until from memous.
Domain 3: Other				
Metri	ric 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.
Metri	ric 6.	Models	N/A	Rating of this factor is not applicable to this kind of information.

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.					
OECD Harmonized	Other Propertie		ac. minerican n	10(0).111 111.		
Template:						
HERO ID:	3615922					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and		None; Experimental; None; mean length	and diameter			
Solvent, Reactivity, Storage	e, and Stability	NA; NR; NR; NR				
Radiolabel, Source, State, and Purity Results Value		according to the USPHS/NIOSH filter me	embrane method f	mixing fiber for cement; Solid; 92% chrysotile, 8% tremolite Notes: Samples prepared or evaluating airborne asbestos fibers m; Mean log aspect ratio = 0.999; Mean length = 2.40 μ m; Mean width = 0.240 μ m;		
Results value		Mean aspect ratio = 9.98	widii = -0.019 μ	in, incan log aspect ratio – 0.777, incan length – 2.40 μ m, incan with = 0.240 μ m,		
Results Details		Measured by STEM with EDXA on a par	rticle-by-particle b	vasis		
Results Remarks		Sample from occupational setting. Log v	alues were conver	ted 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 question, and the methodology's objective is clear.		
	Metric 4:	Reliability/Analytical Method	High	Data are obtained by accepted standard analytical methods.		
Domain 3: Other						
Zoman J. Gulei	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:		. G., Virta, R. L., Segreti, J. M. (1987). Evaluation of the phase contrast microscopy method for the detection of fibrous and other elongated articulates by comparison with a STEM technique. American Industrial Hygiene Association Journal 48(5):471-477.					
OECD Harmonized	Other Propertie		de. American n	idustrial Hygiche Association Journal 40(3).471-477.			
Template:	•						
HERO ID:	3615922						
			EXTRACTIO	ON .			
Parameter		Data					
CASRN and Test Material	1	12172-73-5; Amosite					
Confidentiality, Type, and	Guideline	None; Experimental; None; mean length	and diameter				
Solvent, Reactivity, Storag	ge, and Stability	NA; NR; NR; NR					
Radiolabel, Source, State, and Purity Results Value		20% other Notes: Samples prepared acco Mean log length = 0.610 and 0.715 μ m;	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 Mean log length = 0.610 and 0.715μ m; Mean log width = -0.654 and -0.638μ m; Mean log aspect ratio = 1.264 and 1.353 ; Mean length = 4.07 and 5.19 um; Mean width = 0.222 and 0.230 um; Mean aspect ratio = 18.4 and 22.5				
Results Details		Measured by STEM with EDXA on a particle-by-particle basis					
Results Remarks		2 samples from occupational 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	ility						
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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.			

	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.						
OECD Harmonized	Other Properties		ue. American Ir	idustrial Hygiene Association Journal 48(5):4/1-4//.			
Template:	o uner rroperuse.	~					
HERO ID:	3615922						
			EXTRACTIO	N .			
Parameter		Data					
CASRN and Test Material		12172-73-5; Amosite					
Confidentiality, Type, and G	duideline	None; Experimental; None; mean length	and diameter				
Solvent, Reactivity, Storage	, and Stability	NA; NR; NR; NR					
Radiolabel, Source, State, an Results Value	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 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 = $0.258 \mu m$;					
Results Details		Mean aspect ratio = 17.99 Measured by STEM with EDXA on a par	rticle-by-particle b	nacis			
Results Remarks		Sample from occupational setting. Log vi	• 1				
			EVALUATIO	NI			
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	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.			

Study Citation:		eder, J. G., Virta, R. L., Segreti, J. M. (1987). Evaluation of the phase contrast microscopy method for the detection of fibrous and other elongated neral particulates by comparison with a STEM technique. American Industrial Hygiene Association Journal 48(5):471-477.					
OECD Harmonized	Other Properties		ue. American n	idustriai Hygiche Association Journal 40(3).471-477.			
Template:							
HERO ID:	3615922						
			EXTRACTIO	N .			
Parameter		Data					
CASRN and Test Material		12172-73-5; Amosite					
Confidentiality, Type, and	Guideline	None; Experimental; None; mean length	and diameter				
Solvent, Reactivity, Storag	•	NA; NR; NR; NR					
Radiolabel, Source, State,	and Purity			nsulation removal from ducting; Solid; 60% amosite, 20% chrysotile, 4% gypsum, 16%			
Results Value				IOSH 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 Sample from occupational setting. Log values were converted by reviewer.					
Results Remarks							
			EVALUATIO				
Domain		Metric	Rating	Comments			
Domain 1: Substance	3.6 1	D	TT: 1				
	Metric 1: Metric 2:	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							
Domain J. 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			
	36.4.5	26.11		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 Dotomi	nation	Uich				
Overall Quali	ty Determin	แลนบม	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 elongate mineral particulates by comparison with a STEM technique. American Industrial Hygiene Association Journal 48(5):471-477.					
OECD Harmonized	Other Propertie		uc. American n	idustriai Hygiciic Association Journal 40(3).4/1-4/7.		
Template:						
HERO ID:	3615922					
			EXTRACTIO	N		
Parameter		Data				
CASRN and Test Material		13768-00-8; Actinolite				
Confidentiality, Type, and	Guideline	None; Experimental; None; mean length	and diameter			
Solvent, Reactivity, Storage, and Stability		NA; NR; NR; NR				
Radiolabel, Source, State, and Purity Results Value		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 Mean log length = 0.339 and 0.214 µm; Mean log width = -0.355 and -0.476 µm; Mean log aspect ratio = 0.695 and 0.690; Mean length = 2.18				
D 1. D . 1	and 1.64 μ m; Mean width = 0.442 and 0.334 μ m; Mean aspect ratio = 4.95 and 4.90					
Results Details		Measured by STEM with EDXA on a par				
Results Remarks		2 samples from manufacturing settings. L	Log values were co	onverted by reviewer.		
			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					
	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.		
Overall Qualit	ty Determi	nation	High			

Study Citation: Thorne, P. S., Lightfoot, E. N., Albrecht, R. M. (1985). Physicochemical characterization of cryogenically ground, size separated, fibrogenic particles.

Environmental Research 36(1):89-110.

OECD Harmonized Template:

Other Properties

HERO ID: 3615789

EXTRACTION

Parameter Data

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline None; Experimental; Not Reported

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and 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 Hg; 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

			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 (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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 Quality Determination High

Study Citation:	U.S. EPA, (2014). (IRIS).	Toxicological review of libby amph	nibole asbestos: l	In support of summary information on the Integrated Risk Information System			
OECD Harmonized	Other Properties						
Template:							
HERO ID:	3827272						
			EXTRACTIO	N			
Parameter		Data					
CASRN and Test Material		12425-92-2; winchite					
Confidentiality, Type, and C		none; not specified; not specified					
Solvent, Reactivity, Storage, and Stability		NR; NR; NR					
Radiolabel, Source, State, and Purity Results Value		NR; NR; NR Notes: NR					
Results Value Results Details		Optical property: pleochroism weak to moderate: X = colorless, Y = lig	tht blue_violet 7 -	- light blue			
Results Remarks		Not Reported	giit blue—violet, Z -	- ngm bluc			
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 Reliabili	itv						
Domain 2. Test Renaom	Metric 3:	Reliability/Unbiased	Medium	There is no indication that the methodology for producing the information was biased			
	Medic 3.	(Method Objectivity)	Mediam	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							
Zonam 3. 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 Determina	ntion	High				

^{*} Related References: www.minsocam.oeg/msa/Handbook/Winchite.PDF.

Study Citation: OECD Harmonized	U.S. EPA, (2014). (IRIS). Other Properties	Toxicological review of libby amphibol	e asbestos:	In support of summary information on the Integrated Risk Information System
Template: HERO ID:	3827272			
	3027272	EX	ZED A CELO	NI
Parameter		Data	XTRACTIO	IN .
CASRN and Test Material		17068-76-7; richterite		
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; NR; NR Notes: NR		
Results Value		Optical property: pleochroism		
Results Details		weak to strong in pale yellow, orange, and rec	d	
Results Remarks		Not Reported		
		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.
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 OR includes references to the original sources.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

^{*} Related References: www.minsocam.oeg/msa/Handbook/Winchite.PDF.

Study Citation:	Vaillancourt, A., Denes, G., Mao, L.V., 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 Template:

Other Properties

HERO ID: 6873950

		EXTRACTION
Parameter	Data	

CASRN and Test Material 12001-29-5; Chrysotile

Confidentiality, Type, and Guideline None; Experimental; None; Average fiber diameter

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NA; Mined in Asbestos, Quebec; Solid; Commercial grade Notes: batch 7TF12

Average fiber diameter: 156 angstroms Results Value

Results Details NA Results Remarks NA

			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	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.
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.

Study Citation:		., Denes, G., Mao, L.V., R. (1997). Reaction of magnesium. Materials Research Society		e asbestos in acids: Mechanism of transformation to silicon dioxide hemihydrate		
OECD Harmonized Template:	Other Properties		Symposium i	occedings, voi. 433 .71-70.		
HERO ID:	6873950					
			EXTRACTIO)N		
Parameter		Data				
CASRN and Test Material		12001-29-5; Chrysotile				
Confidentiality, Type, and	Guideline	None; Experimental; Not reported; resista	ance to acids			
Solvent, Reactivity, Storage	e, and Stability	NR; NR; NR; NR				
Radiolabel, Source, State, and Purity		NA; Mined in Asbestos, Quebec; Solid; Commercial grade Notes: batch 7TF12				
Results Value Results Details		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 Minor smooth changes from acetic acid (ACA) and oxalic acid (OXA) with secondary leaching				
			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 question, 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.		
Overall Quali	tr. Dotomi	nation	High			

Study Citation:
OECD Harmonized

Virta, R. L. (2011). Asbestos. :1-40.

OECD Harmonized

Other Properties

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, and Stability	NR; NR; NR; NR		
Radiolabel, Source, State, 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 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:	(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 Quality Determination

Medium

Study Citation: OECD Harmonized Virta, R. L. (2011). Asbestos. :1-40.

Data

Templete:

Other Properties

Template:

Parameter

HERO ID: 3827175

EXTRACTION

CASRN and Test Material 12001-29-5; Chrysotile

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 NR; NR; NR

Results Value Zeta potential: +13.6 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 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	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

Virta, R. L. (2011). Asbestos. :1-40.

OECD Harmonized

Other Properties

Template:

HERO ID: 3827175

EXTRACTION

Parameter Data

CASRN and Test Material 12172-73-5; Amosite

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: CAS in paper: Amosite [19172-73-5]

Results Value Zeta potential: -20 to -40 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 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 Quality Determination

Medium

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template:

HERO ID: 3859385

EXT	א סדי	C7	rt7) N

Parameter Data CASRN and Test Material 12001-28-4; crocidolite 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; NR Notes: NR

Results Value optical properties: biaxial negative oblique extinction

Results Details not reported Results Remarks not reported

			EVALUATIO	N
Domain		Metric	Rating	Comments
Domain 1: Substance				
M	Ietric 1:	Representativeness	High	Data are measured or estimated for the subject chemical substance.
N.	Metric 2:	Appropriateness	High	Measured data are consistent with the subject chemical substance structural features.
Domain 2: Test Reliability				
M	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.
M	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	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.
N	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Virta, R. L. (2004). Asbestos. 3:288-319.

Data

OECD Harmonized

Other Properties

Template: HERO ID:

Parameter

3859385

EXTR		α	PТ	^	
LAIK	A١	LΙΙ		w	ж

CASRN and Test Material 12001-28-4; crocidolite
Confidentiality, Type, and Guideline none; not specified; not specified
Solvent, Reactivity, Storage, and Stability NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Results Value 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 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	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.

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template:

HERO ID: 3859385

EXTRACTION

Parameter Data

CASRN and Test Material 14567-73-8; tremolite

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; NR Notes: NR

tensile strength: <500 MPa (to convert MPa to psi, multiply by 145) Results Value

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 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	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.

Study Citation: OECD Harmonized Virta, R. L. (2004). Asbestos. 3:288-319.

Data

Template:

Other Properties

Parameter

Results Value

Results Details

Results Remarks

HERO ID: 3859385

FX	FR /	C	$\Gamma I C$	N

CASRN and Test Material Confidentiality, Type, and Guideline Solvent, Reactivity, Storage, and Stability Radiolabel, Source, State, and Purity

12001-28-4; crocidolite none; not specified; not specified

NR; NR; NR; NR

NR; NR; NR; NR Notes: NR hardness = 4.0 Mohs

not reported 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 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. (Method Objectivity) Metric 4: Reliability/Analytical Method Low The analytical method is unknown and there is no indication that a reliable method was 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

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template: HERO ID:

Parameter

3859385

EXT	$\Gamma R A$	C	П	U.	N

CASRN and Test Material 14567-73-8; tremolite

none; not specified; not specified Confidentiality, Type, and Guideline

Solvent, Reactivity, Storage, and Stability NR; NR; NR; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Results Value resistance to acids: good; resistance to alkalies: good

Data

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

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template:

HERO ID: 3859385

EXTRACTION

Parameter Data

CASRN and Test Material 12172-73-5; amosite

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; NR Notes: NR

Results Value tensile strength: 1500-2600 MPa (to convert MPa to psi, multiply 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 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.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

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Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template: **HERO ID:**

3859385

EXTRACTION

Parameter Data

CASRN and Test Material 12001-28-4; crocidolite

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; NR Notes: NR

tensile strength: 1400-4600 MPa (to convert MPa to psi, multiply by 145) Results 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.
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	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.

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template: HERO ID:

Parameter

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EXTR	A :	C	rt/	n	N
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CASRN and Test Material 14567-73-8; tremolite

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; NR Notes: NR

Results Value optical properties: biaxial negative oblique extinction

Data

			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
		(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.

Study Citation: OECD Harmonized Virta, R. L. (2004). Asbestos. 3:288-319. Other Properties

Template:

HERO ID: 3859385			
		EXTRACTIO	N
Parameter	Data		
CASRN and Test Material	14567-73-8; tremolite		
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; 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			
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.
Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.

Overall Quality Determination		High		
	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.
Domain 3: Other				
	Metric 4:	Reliability/Analytical Method	Low	The analytical method is unknown and there is no indication that a reliable method was used.
	wiettie 3.	(Method Objectivity)	Wiedium	towards a particular product or outcome.

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template:

HERO ID: 3859385

EXTRACTION

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; NR

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

tensile strength: 1100-4400 MPa (to convert MPa to psi, multiply by 145) Results 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.
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	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.

Study Citation: OECD Harmonized	Virta, R. L. (20) Other Propertie	04). Asbestos. 3:288-319. s		
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		NR; NR; NR; NR		
Radiolabel, Source, State,	and Purity	NR; NR; NR; NR Notes: NR		
Results Value		hardness = 5.5-6.0 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	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	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 Quali	ty Determi	nation	High	

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template:

HERO ID: 3859385

EXTRACTION

Parameter Data

CASRN and Test Material 12172-73-5; amosite

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; NR Notes: NR

Results Value optical properties: biaxial positive-parallel extinction

			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 (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.

Study Citation: OECD Harmonized Virta, R. L. (2004). Asbestos. 3:288-319.

Template:

Domain 3: Other

Other Properties

Template:

HERO ID: 3859385			
		EXTRACTIO	N
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; NR		
Radiolabel, Source, State, 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 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.

High

N/A

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

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

Overall Quality Determination	High
Overall Quality Determination	****5**

Models

Databases

Metric 5:

Metric 6:

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template: HERO ID:

3859385

EXT	RΔ	C_{1}	TO	N

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; NR Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR optical properties: biaxial positive-parallel extinction Results Value 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 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.
	Metric 6:	Models	N/A	Rating of this factor is not applicable to this kind of information.

Overan Quanty Determination

High

Virta, R. L. (2004). Asbestos. 3:288-319.

OECD Harmonized

Other Properties

Template:

HERO ID: 3859385

EXTRACTION

Parameter Data

CASRN and Test Material 12172-73-5; amosite

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; NR Notes: NR

Results Value zeta potential: -20 to -40 (surface charge, mV); resistance to acids: fair, slowly attacked; resistance to alkalies: good

			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	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.

Virta, R. L. (2004). Asbestos. 3:288-319.

Data

OECD Harmonized

Other Properties

Template: HERO ID:

Parameter

3859385

EXTRACTION

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

Radiolabel, Source, State, and Purity NR; NR; NR; NR Notes: NR

Results Value zeta potential: +13.6 to +54 (surface charge, mV); resistance to acids: weak, undergoes fairly rapid attack; resistance to alkalies: very good

Results Details chrysotile fibers tend to become negative after weathering and/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	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	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 Determi	ination	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.

Tompleto:

Other Properties

Template:

HERO ID: 6880237

EVTD	ACTION
CAIN	ACTION

Parameter	Data
CASRN and Test Material	12172-67-7; Actinolite
Confidentiality, Type, and Guideline	None; Experimental; Gemological properties and mineral compositions of black nephrite from Guangxi
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; Solid; NR
Results Value	Luster: Greasy to vitreous
Results Details	Not Reported
Results Remarks	4 samples containing 60-99% ferro-actinolite

			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	ility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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:
OECD Harmonized
Template:

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

Template: HERO ID:

6880237

EXTRACTION

Parameter	Data
CASRN and Test Material	12172-67-7; Actinolite
Confidentiality, Type, and Guideline	None; Experimental; Gemological properties and mineral compositions of black nephrite from Guangxi
Solvent, Reactivity, Storage, and Stability	NR; NR; NR
Radiolabel, Source, State, and Purity	NR; NR; Solid; NR
Results Value	Actinolite fibers were $20 \times 0.5 \ \mu \text{m}$
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 Reliab	oility			
	Metric 3:	Reliability/Unbiased (Method Objectivity)	High	The methodology for producing the information is designed to answer a specific question, 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:	Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.
OECD Harmonized	Miscellaneous

Template:

HERO ID: 3646977

EXTRACTION			
Parameter	Data		
CASRN	12001-29-5		
Confidentiality, Type, and Guideline	none; not specified; Not reported		
Solvent, Reactivity, Storage, and Stability	NR; 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		
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 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.

Overall Quality Determination	Medium
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Study Citation: Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30. Miscellaneous

OECD Harmonized Template:

Parameter

HERO ID: 3646977

> EXTRACTION Data

CASRN 12172-73-5

Confidentiality, Type, and Guideline none; not specified; Not reported

Solvent, Reactivity, Storage, 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 -Temperature Not reported System Not reported pН 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 Reliabi	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				
Domain 5. Other	Metric 5:	Databases	N/A	Detice of this feeter is not applied to the third of information
				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 Study Citation: Gaze, R. (1965). The physical and molecular structure of asbestos. Annals of the New York Academy of Sciences 132(1):23-30.

Miscellaneous

OECD Harmonized Template:

Parameter

l'emplate:

HERO ID: 3646977

EXTRA	ACTION

CASRN 12001-28-4

Confidentiality, Type, and Guideline none; not specified; Not reported

Data

Solvent, Reactivity, Storage, and Stability 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 Temperature 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	2			
	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 (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

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 · m ³ /mol	Atmospheres - cubic meters per mole	
C	Celsius	
CASRN	Chemical Abstract Service registry number	
cР	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 ³	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)	
pН	Negative base 10 Log of Hydrogen Ion (H+) Concentration in Aque-	
	ous Solution	
pKa	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)	
-	Continued on next page	

Continued on next page ... Page 520 of 521

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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	