⊕EPA

United States
Environmental Protection Agency

Office of Chemical Safety and
Pollution Prevention

Draft Risk Evaluation for
Methylene Chloride

Systematic Review Supplemental File:

Data Quality Evaluation of Physical-Chemical Properties Studies

CASRN: 75-09-2

October 2019

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Table 1. Physical Form Study Summary for Methylene Chloride

Study Reference:	**U.S. Coast Guard (1984). CHRIS hazardous chemical data. U.S. Department of Transportation. Washington, DC.**		
Note:	U.S. Coast Guard (1984) reported the physical form of methylene chloride.		
Domain/Metric	**Description/ Definition**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comment**
Representativeness	The information or data reflects the data and chemical substance type.	High	The information was measured for the subject chemical substance.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The information is consistent with the nature of the substance.
Evaluation/ Review	The information or data reported has reliable review.	Medium	The data collection is from a known source that lists several reliable primary sources in its references. However; individual values are not cited to their original sources.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Not rated	Data source does not provide information to determine the method objectivity (unbiased method). Thus, the domain/metric was not rated.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	Not rated	This metric is not applicable to this information type.
Overall Quality Level			**High**

Table 2. Melting Point Study Summary for Methylene Chloride

Study Reference:	**O'Neil, MJ. (2013). The Merck index: An encyclopedia of chemicals, drugs, and biologicals. In MJ O'Neil (Ed.), (15th ed.). Cambridge, UK: Royal Society of Chemistry.**		
Note:	O'Neil (2013) reported various physical-chemical properties and only the confidence of the melting point is evaluated.		
Domain/Metric	**Description/ Definition**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comment**
Representativeness	The information or data reflects the data and chemical substance type.	High	The data was measured for the substance of interest.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The measured value is consistent with the nature of the substance.
Evaluation/ Review	The information or data reported has reliable review.	High	The information is from a recognized data collection where data are peer-reviewed by experts in the field and are broadly available to the public for review and use.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Not rated	Data source does not provide information to determine the method objectivity (unbiased method). Thus, the domain/metric was not rated.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	Low	Data source does not provide information regarding the analytical method.
Overall Quality Level			**High**

Table 3. Boiling Point Study Summary for Methylene Chloride

Study Reference:	O'Neil, MJ. (2013). The Merck index: An encyclopedia of chemicals, drugs, and biologicals. In MJ O'Neil (Ed.), (15th ed.). Cambridge, UK: Royal Society of Chemistry.		
Note:	O'Neil (2013) reported various physical-chemical properties and only the confidence of the boiling point is evaluated.		
Domain/Metric	Description/ Definition	Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]	Comment
Representativeness	The information or data reflects the data and chemical substance type.	High	The data was measured for the substance of interest.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The measured value is consistent with the nature of the substance.
Evaluation/ Review	The information or data reported has reliable review.	High	The information is from a recognized data collection where data are peer-reviewed by experts in the field and are broadly available to the public for review and use.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Not rated	Data source does not provide information to determine the method objectivity (unbiased method). Thus, the domain/metric was not rated.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	Low	Data source does not provide information regarding the analytical method.
Overall Quality Level			High

Table 4. Density Study Summary for Methylene Chloride

Study Reference:	**O'Neil, MJ. (2013). The Merck index: An encyclopedia of chemicals, drugs, and biologicals. In MJ O'Neil (Ed.), (15th ed.). Cambridge, UK: Royal Society of Chemistry.**		
Note:	O'Neil (2013) reported various physical-chemical properties and only the confidence of the density is evaluated.		
Domain/Metric	**Description/ Definition**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comment**
Representativeness	The information or data reflects the data and chemical substance type.	High	The data was measured for the substance of interest.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The measured value is consistent with the nature of the substance.
Evaluation/ Review	The information or data reported has reliable review.	High	The information is from a recognized data collection where data are peer-reviewed by experts in the field and are broadly available to the public for review and use.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Not rated	Data source does not provide information to determine the method objectivity (unbiased method). Thus, the domain/metric was not rated.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	Low	Data source does not provide information regarding the analytical method.
Overall Quality Level			**High**

Table 5. Vapor Pressure Study Summary for Methylene Chloride

Study Reference:	Boublík, T; Fried, V; Hála, E. (1984). The vapour pressures of pure substances: Selected values of the temperature dependence of the vapour pressures of some pure substances in the normal and low pressure region (2nd Revised ed.). Amsterdam, The Netherlands: Elsevier Science Publishers.		
Note:	Boublik et al. (1984) reported the vapor pressure of methylene chloride.		
Domain/Metric	Description/ Definition	Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]	Comment
Representativeness	The information or data reflects the data and chemical substance type.	High	The value was derived by interpolation from a peer-reviewed set of measured vapor pressures (Std. Dev. = 0.09 mm Hg).
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The value is consistent with the nature of the substance.
Evaluation/ Review	The information or data reported has reliable review.	High	The data set has been cited to its original source which is peer-reviewed. The authors also state that the quality of the experimental data was considered before its inclusion in the data collection.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Not rated	Data source does not provide information to determine the method objectivity (unbiased method). Thus, the domain/metric was not rated.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	Low	Data source does not provide information regarding the analytical method.
Overall Quality Level			High

Table 6. Vapor Density Study Summary for Methylene Chloride

Study Reference:	Holbrook, MT. (2003). Methylene chloride. In: Kirk-Othmer Encyclopedia of Chemical Technology. John Wiley & Sons, Inc.		
Note:	Holbrook (2003) reported the vapor density of methylene chloride.		
Domain/Metric	Description/ Definition	Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]	Comment
Representativeness	The information or data reflects the data and chemical substance type.	High	The data was measured for the substance of interest.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The measured value is consistent with the nature of the substance.
Evaluation/ Review	The information or data reported has reliable review.	High	The information is from a recognized data collection in which results have been selected by experts based on their quality and availability. References to the original sources are included.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Not rated	Data source does not provide information to determine the method objectivity (unbiased method). Thus, the domain/metric was not rated.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	Low	Data source does not provide information regarding the analytical method.
Overall Quality Level			High

Table 7. Water Solubility Study Summary for Methylene Chloride

Study Reference:	Horvath, AL. (1982). Halogenated hydrocarbons: solubility-miscibility in water. Marcel Dekker, Inc. New York, New York.		
Note:	Horvath (1982) reported the water solubility of methylene chloride.		
Domain/Metric	Description/ Definition	Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]	Comment
Representativeness	The information or data reflects the data and chemical substance type.	High	The data was measured for the substance of interest.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The consistency of the value with data measured for other similar chemicals was considered before its inclusion in the data collection.
Evaluation/ Review	The information or data reported has reliable review.	High	The value is from a data collection where data were peer-reviewed, cited to original sources, and had their experimental quality examined before inclusion.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	High	The method for producing the data is not biased towards a particular outcome.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	High	The data collection only includes values that have been obtained using reliable and accepted analytical methods.
Overall Quality Level			High

Table 8. Octanol-water Partition Coefficient Study Summary for Methylene Chloride

Study Reference:	Hansch, C. (1995). Fundamentals and applications in chemistry and biology - hydrophobic, electronic and steric constants. In Exploring QSAR. Washington DC: American Chemical Society Professional Reference Book/Oxford University Press.		
Note:	Hansch (1995) reported the Log K_{OW} of methylene chloride.		
Domain/Metric	Description/ Definition	Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]	Comment
Representativeness	The information or data reflects the data and chemical substance type.	High	The data was measured for the substance of interest.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The measured value is consistent with the nature of the substance.
Evaluation/ Review	The information or data reported has reliable review.	High	The information is from a recognized data collection that has been compiled by experts and includes references to the original sources. The original source for this value is a peer-reviewed journal.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Not rated	Data source does not provide information to determine the method objectivity (unbiased method). Thus, the domain/metric was not rated.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	Low	Data source does not provide information regarding the analytical method.
Overall Quality Level			High

Table 9. Henry's Law Constant Study Summary for Methylene Chloride

Study Reference:	**Leighton, DT; Calo, JM. (1981). Distribution coefficients of chlorinated hydrocarbons in dilute air-water systems for groundwater contamination applications.**		
Note:	Leighton and Calo (1981) reported the Henry's Law constant as a dimensionless value and it has been converted to atm-m^3/mol.		
Domain/Metric	**Description/ Definition**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comment**
Representativeness	The information or data reflects the data and chemical substance type.	High	The value was measured for the subject chemical substance.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The measured value is consistent with the nature of the substance.
Evaluation/ Review	The information or data reported has reliable review.	High	The source is a peer-reviewed journal.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	High	The method for producing this value is not biased towards a particular outcome.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	High	The analytical method used to measure this value is an accepted standard method.
Overall Quality Level			**High**

Table 10. Viscosity Study Summary for Methylene Chloride

Study Reference:	Rossberg, M., Lendle, W., Pfleiderer, A., Togel, A. (2011). Chloromethanes. In: Ullmann's Encyclopedia of Industrial Chemicals. Wiley-VCH Verlag GmbH & Co.		
Note:	Rossberg et al. (2011) reported the viscosity of methylene chloride.		
Domain/Metric	Description/ Definition	Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]	Comment
Representativeness	The information or data reflects the data and chemical substance type.	High	The value was measured for the subject chemical substance.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The value was similar to measured values for chemicals of similar structure.
Evaluation/ Review	The information or data reported has reliable review.	High	The value was from a peer-reviewed source.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Not rated	Data source does not provide information to determine the method objectivity (unbiased method). Thus, the domain/metric was not rated.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	Low	Data source does not provide information regarding the analytical method.
Overall Quality Level			High

Table 11. Refractive Index Study Summary for Methylene Chloride

Study Reference:	O'Neil, MJ. (2013). The Merck index: An encyclopedia of chemicals, drugs, and biologicals. In MJ O'Neil (Ed.), (15th ed.). Cambridge, UK: Royal Society of Chemistry.		
Note:	O'Neil (2013) reported various physical-chemical properties and only the confidence of the refractive index is evaluated.		
Domain/Metric	Description/ Definition	Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]	Comment
Representativeness	The information or data reflects the data and chemical substance type.	High	The data was measured for the substance of interest.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The measured value is consistent with the nature of the substance.
Evaluation/ Review	The information or data reported has reliable review.	High	The information is from a recognized data collection where data are peer-reviewed by experts in the field and are broadly available to the public for review and use.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Not rated	Data source does not provide information to determine the method objectivity (unbiased method). Thus, the domain/metric was not rated.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	Low	Data source does not provide information regarding the analytical method.
Overall Quality Level			High

Table 12. Dielectric Constant Study Summary for Methylene Chloride

Study Reference:	**Laurence et al. (1994). The empirical treatment of solvent-solute interactions: 15 years of pi*. J Phys Chem 98: 5807-5816.**		
Note:	Laurence et al. (1994) reported the dielectric constant of methylene chloride.		
Domain/Metric	**Description/ Definition**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comment**
Representativeness	The information or data reflects the data and chemical substance type.	High	The value was measured for the substance of interest
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	The value was similar to those measured for structurally similar compounds.
Evaluation/ Review	The information or data reported has reliable review.	High	The information is from a peer-reviewed journal.
Reliability/ Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	High	The methodology for producing the information is designed to answer a specific question.
Reliability/ Analytic Method	The information or data reported is from a reliable method.	High	The value was obtained by an accepted standard analytical method.
Overall Quality Level			**High**