United States
Environmental Protection Agency

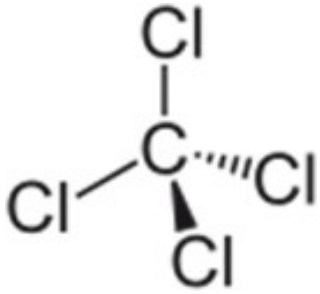
Office of Chemical Safety and
Pollution Prevention

Final Risk Evaluation for Carbon Tetrachloride

Systematic Review Supplemental File:

Data Quality Evaluation of Physical and Chemical Properties Studies

CASRN: 56-23-5



October 2020

EPA's Office of Pollution Prevention and Toxics (OPPT) developed data quality criteria for physical and chemical property studies. The first version of the criteria was documented in the *Application of Systematic Review in TSCA Risk Evaluations* document (EPA Document#740-P1-8001). The initial criteria were updated after considering EPA/OPPT's practical experience and comments from the public. This systematic review supplemental document describes the updated data quality criteria for physical and chemical studies that EPA/OPPT intends to apply for the TSCA risk evaluations. Refer to Appendix B of the *Application of Systematic Review in TSCA Risk Evaluations* document for details about the data quality evaluation tools.

Table of Contents

Table 1. Physical Form Study Summary for Carbon Tetrachloride (1 of 2)

Study Reference:	**CHRIS. (1984). CHRIS hazardous chemical data. US Coast Guard. Vol 2. Washington, DC.** **HERO ID: 17566**		
Note:	CHRIS (1984) was not available for review. Data from CHRIS (June 1999) was evaluated in its place.		
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.	Low	The information or data is from a recognized data collection.
Reliability/Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	Medium	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			Medium

Table 2. Physical Form Study Summary for Carbon Tetrachloride (2 of 2)

Study Reference:	**O'Neil, M.J., ed. (1996). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 12th ed., Whitehouse Station, NJ: Merck and Co., Inc., p. 1054.** **HERO ID: 670297**		
Note:	O'Neil (1996) reported the physical form.		
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	Data cited as found in the literature.
Evaluation/Review	The information or data reported has reliable review.	High	The information or data is from a recognized 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 3. Melting Point Study Summary for Carbon Tetrachloride

Study Reference:	**Lide DR. (1999). CRC handbook of chemistry and physics: A ready-reference book of chemical and physical data. 80th ed. CRC Press, Boca Raton, FL.** **HERO ID: 3827230**		
Note:	Lide (1999) reported the melting point.		
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. Boiling Point Study Summary for Carbon Tetrachloride

Study Reference:	**Lide DR. (1999). CRC handbook of chemistry and physics: A ready-reference book of chemical and physical data. 80th ed. CRC Press, Boca Raton, FL.** **HERO ID: 3827230**		
Note:	Lide (1999) reported the boiling point.		
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. Density Study Summary for Carbon Tetrachloride

Study Reference:	**Lide DR. (1999). CRC handbook of chemistry and physics: A ready-reference book of chemical and physical data. 80th ed. CRC Press, Boca Raton, FL.** **HERO ID: 3827230**		
Note:	Lide (1999) reported density.		
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 6. Vapor Pressure Study Summary for Carbon Tetrachloride

Study Reference:	**Boublik T et al. 1984. The vapor 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. Vol. 17. Amsterdam, Netherlands: Elsevier Sci. Publ.** **HERO ID: 194873**		
Note:	Boublik et al. (1984) reported the vapor pressure.		
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. Vapor Density Study Summary for Carbon Tetrachloride

Study Reference:	**Boublik T et al. 1984. The vapor 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. Vol. 17. Amsterdam, Netherlands: Elsevier Sci. Publ.** **HERO ID: 194873**		
Note:	Vapor density was calculated from Boublik et al. (1984).		
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 calculated 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 8. Water Solubility Study Summary for Carbon Tetrachloride

Study Reference:	**Horvath AL. (1982) Halogenated hydrocarbons: solubility-miscibility with water. New York, NY: Marcel Dekker, Inc.** **HERO ID: 194749**		
Note:	Horvath (1982) reported the water solubility.		
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 data collection where data are peer-reviewed by experts in the field and are broadly available to the public for review and use. Original sources are also referenced.
Reliability/Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	High	Methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.
Reliability/Analytic Method	The information or data reported is from a reliable method.	High	Data are obtained by accepted standard analytic methods.
Overall Quality Level			**High**

Table 9. Octanol-water Partition Coefficient Study Summary for Carbon Tetrachloride

Study Reference:	**Hansch, C., Leo, A., D. Hoekman. (1995). Exploring QSAR - Hydrophobic, Electronic, and Steric Constants. Washington, DC: American Chemical Society.** **HERO ID: 51424**		
Note:	Hansch et al. (1995) reported the log Kow.		
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 10. Henry's Law Constant Study Summary for Carbon Tetrachloride

Study Reference:	**Leighton DT, Calo JM. (1981). Distribution coefficients of chlorinated hydrocarbons in dilute air-water systems for groundwater contamination applications. J Chem Eng Data. 26 (4): 382-85.** **HERO ID: 194928**		
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 11. Flash Point Study Summary for Carbon Tetrachloride

Study Reference:	**CHRIS. (1984). CHRIS hazardous chemical data. US Coast Guard. Vol 2. Washington, DC.** **HERO ID: 5348366**		
Note:	CHRIS (1984) was not available; however, a more recent version CHRIS (1999) reporting flash point was reviewed.		
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 or data is from a recognized 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 12. Viscosity Study Summary for Carbon Tetrachloride

Study Reference:	**Daubert, T.E., R.P. Danner. (1989). Physical and Thermodynamic Properties of Pure Chemicals Data Compilation. Washington, DC: Taylor and Francis.** **HERO ID: 3827242**		
Note:	Daubert and Danner (1989) reported the viscosity.		
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	Data are measured for the subject chemical substance.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	Measured data are consistent with the subject chemical substance structural features.
Evaluation/Review	The information or data reported has reliable review.	High	The information or data is from a recognized data collection collection/repository where data are peer-reviewed by experts in the field, are broadly available to the public for review and use and include references to the original sources.
Reliability/Unbiased (Method Objectivity)	The method for producing the data/information is not biased towards a particular product or outcome.	High	Methodology for producing the information is designed to answer a specific question, and the methodology's objective is clear.
Reliability/Analytic Method	The information or data reported is from a reliable method.	Low	Analytical method is not reported.
Overall Quality Level			**High**

Table 13. Refractive Index Study Summary for Carbon Tetrachloride

Study Reference:	**O'Neil, M.J., ed. (1996). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 12th ed., Whitehouse Station, NJ: Merck and Co., Inc., p. 1054.** **HERO ID: 670297**		
Note:	O'Neil (1996) reported the refractive index.		
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	Data cited as found in the literature.
Evaluation/Review	The information or data reported has reliable review.	High	The information or data is from a recognized 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 14. Dielectric Constant Study Summary for Carbon Tetrachloride

Study Reference:	**Norbert, AL; Dean, JA. (1967). Lange's Handbook of Chemistry. McGraw-Hill NY, NY.** **HERO ID: 3836460**		
Note:	Norbert and Dean (1967) reported the dielectric constant.		
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	Data are measured for the subject chemical substance.
Appropriateness	The information or data reflects anticipated results based on chemical structural features or behaviors.	High	Measured data are consistent with the subject chemical substance structural features.
Evaluation/Review	The information or data reported has reliable review.	High	The information or data is from a recognized 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**