

7. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding chloromethane in air, water and other media are summarized in Table 7-1.

An acute inhalation MRL of 0.5 ppm was derived from a NOAEL of 50 ppm for motor coordination and damage to the cerebellar granule cells in a study by Landry et al. (1985).

An intermediate inhalation MRL of 0.2 ppm was derived from a LOAEL of 51 ppm for increased liver enzymes in male mice at the 6-month time point in a 2-year study by CIIT (1981).

A chronic inhalation MRL of 0.05 ppm was derived from a LOAEL of 51 ppm for axonal swelling in male mice in a 2-year study by CIIT (1981).

The risk assessments for establishing a reference concentration (RfC) for chronic inhalation exposures and a reference dose (RfD) for chronic oral exposures to chloromethane are undergoing review by an EPA work group (IRIS 1997). However, the EPA Office of Water reports an RfD of 0.004 mg/kg/day (EPA 1996a).

The EPA has not assigned a carcinogenicity classification for chloromethane (IRIS 1997). Health advisories published by the EPA Office of Water assign chloromethane to cancer group C, which indicates that the substance is a possible human carcinogen (EPA 1996a). The International Agency for Research on Cancer (IARC) has classified chloromethane as Group 3; not classifiable as to its carcinogenicity to humans (IARC 1987). The National Toxicology Program (NTP) has not classified the chemical for carcinogenicity. The National Institute for Occupational Safety and Health (NIOSH) recommends that chloromethane be treated as a potential occupational carcinogen (NIOSH 1992).

Chloromethane is on the list of chemicals subject to the requirements of "The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (EPA 1988c). Section 313 of Title III of EPCRA, requires owners and operators of certain facilities that manufacture, import, process, or otherwise use the chemicals on this list to report annually their release of those chemicals to any environmental media (U.S. Congress 1986).

OSHA requires employers of workers who are occupationally exposed to chloromethane to institute engineering controls and work practices to reduce and maintain employee exposure at or below permissible exposure limits (PELs). The employer must use controls and practices, if feasible, to reduce exposure to or below an 8-hour time-weighted average (TWA) of 100 ppm (OSHA 1974). The acceptable ceiling concentration for chloromethane is 200 ppm. The acceptable maximum peak above this ceiling concentration is 300 ppm. Therefore, during an 8-hour work shift a person may be exposed to a concentration of chloromethane measuring 200 ppm or greater, but never more than 300 ppm and only for a maximum period of 5 minutes within any 3-hour period. An exposure such as this must be compensated by exposures to concentrations less than 100 ppm so that the cumulative exposure for the 8-hour shift does not exceed the 100 ppm exposure limit (OSHA 1974).

The EPA regulates chloromethane under the Clean Air Act (CAA) and has designated chloromethane as a hazardous air pollutant (HAP). The major source category for which chloromethane emissions are controlled is the synthetic organic chemicals manufacturing industry (SOCMI) and includes equipment leaks (EPA 1983b) distillation operations (EPA 1990), and reactor processes (EPA 1993a).

Chloromethane is regulated by the Clean Water Effluent Guidelines in Subchapter N of Title 40 of the Code of Federal Regulations. Electroplating is the point source category for which chloromethane is controlled as a total toxic organic (EPA 1981a). The point source categories for which chloromethane has specific regulatory performance standards include organic chemicals, plastics, and synthetic fibers (EPA 1987b, 1987c, 1987d, 1987e, 1987f, 1987g, 1987h, 1987i, 1987j, 1987k), steam electric power generators (EPA 1982c), metal finishing (EPA 1983c).

The Resource Conservation and Recovery Act (RCRA) identifies chloromethane as a hazardous waste from non-specific sources and has assigned it the hazardous waste numbers F024 and F025 (EPA 1981c).

Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), owners of vessels or facilities are required to immediately report release of chloromethane equal to or greater than the reportable quantity of 100 pounds (45.4 kg) (EPA 1985).

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Table 7-1. Regulations and Guidelines Applicable to Chloromethane

Agency	Description	Information	References
<u>INTERNATIONAL</u>			
Guidelines:			
WHO	Drinking-water guideline values for health-related organics	None	WHO1984
IARC	Carcinogenic classification	Group 3 ^a	IARC 1987
<u>NATIONAL</u>			
Regulations:			
a. Air:			
OSHA	Air contaminants		
	Permissible Exposure Limit (PEL) 8-hr. Time weighted average (TWA)	100 ppm	29 CFR 1910.1000 OSHA 1974 ^b
	Acceptable ceiling concentration	200 ppm	
	Acceptable maximum peak above ceiling for an 8-hour shift (max. duration of 5 min. in any 3 hours)	300 ppm	
EPA OAR	Hazardous Air Pollutants	Yes	Clean Air Act Amendment Title III, Section 112 (b) U.S. Congress 1990
	Standards of Performance for New Stationary Sources-		
	Subpart VV: Equipment leaks of VOCs in the Synthetic Organic Chemicals Manufacturing Industry (SOCMI)--chemicals produced by affected facilities	Yes	40 CFR 60.489 EPA 1983b
	Subpart NNN: VOC emissions from SOCMI distillation operations--chemical affected	Yes	40 CFR 60.667 EPA 1990a
	Subpart RRR: VOC emissions from SOCMI reactor processes--chemicals affected	Yes	40 CFR 60.707 EPA 1993a
	National Emission Standards for Hazardous Air Pollutants for Source Categories		
	National Emission Standards for Organic Hazardous Air Pollution from the Synthetic Organic Chemical Manufacturing Industry-Delegation of Authority	Yes	40 CFR 63.106 EPA 1994a

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Table 7-1. Regulations and Guidelines Applicable to Chloromethane (continued)

Agency	Description	Information	References
<u>NATIONAL</u> (cont.)			
b. Water			
EPA ODW	National Primary Drinking Water Regulations	Yes	40 CFR 141.40 EPA 1987a
	Special regulations, including monitoring regulations and prohibitions on lead use		
EPA OW	EPA Administered Permit Programs: The NPDES-		
	Organic toxic pollutants in each of four fractions in analysis by GC/MS	Yes	40 CFR 122, Appendix D EPA 1983d
	Criteria and Standards for the NPDES-		
	Methods for organic chemical analysis of municipal and industrial wastewater (Methods 601, 624, and 1624)	Yes	40 CFR 136, Appendix A EPA 1973
	General pretreatment regulations for existing and new sources of pollution-		
	Pollutants eligible for a removal credit	Yes	40 CFR 403, Appendix G EPA 1981a
	Electroplating Point Source Category-		
	General definition	Yes	40 CFR 413.02 EPA 1981a
	Organic Chemicals, Plastics, and Synthetic fibers		
	Subpart B-Rayon Fibers-PSES		40 CFR 414.25 EPA 1987c
	Maximum for any one day	295 µg/L	
	Maximum for monthly average	110 µg/L	
	Subpart C-Other Fibers-PSES		40 CFR 414.35 EPA 1987e
	Maximum for any one day	295 µg/L	
	Maximum for monthly average	110 µg/L	
	Subpart D-Thermoplastic Resins-PSES		40 CFR 414.45 EPA 1987g
	Maximum for any one day	295 µg/L	
	Maximum for monthly average	110 µg/L	
	Subpart E-Thermosetting Resins		40 CFR 414.55 EPA 1987f
	Maximum for any one day	295 µg/L	
	Maximum for monthly average	110 µg/L	

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Table 7-1. Regulations and Guidelines Applicable to Chloromethane (continued)

Agency	Description	Information	References
<u>NATIONAL</u> (cont.)			
	Subpart F-Commodity Organic Chemicals		40 CFR 414.65 EPA 1987h
	Maximum for any one day	295 µg/L	
	Maximum for monthly average	110 µg/L	
	Subpart G-Bulk Organic Chemicals-		
	Applicability; description of the bulk organic chemicals subcategory	Yes	40 CFR 414.70 EPA 1987i
	PSES		
	Maximum for any one day	295 µg/L	40 CFR 414.75
	Maximum for monthly average	110 µg/L	EPA 1987j
	Subpart H-Speciality Organic Chemicals--		
	PSES		
	Maximum for any one day	295 µg/L	40 CFR 414.85
	Maximum for monthly average	110 µg/L	EPA 1987o
	Subpart I-Direct Discharge Point Sources that Use End-of-Pipe Biological Treatment-effluent limitations: BAT and NSPS		40 CFR 414.91 EPA 1987k
	Maximum for any one day	190 µg/L	
	Maximum for monthly average	86 µg/L	
	Subpart J-Direct Discharge Point Sources That Do Not use End-of Pipe Biological Treatment-effluent limitations: BAT and NSPS		
	Maximum for any one day	295 µg/L	40 CFR 414.101
	Maximum for monthly average	110 µg/L	EPA 1987m
	Steam Electric Power Generating Point Source Category		
	Pretreatment standards for new sources (PSNS)		40 CFR 423.17 EPA 1982d
	Maximum for any time	0.2 mg/L	
	List of 126 priority pollutants	Yes	40 CFR 423, Appendix A EPA 1982e
	Metal Finishing Point Source Category		
	Metal finishing subcategory- Definition of total toxic organics (TTO)	>0.01 mg/L	40 CFR 433.10 EPA 1983e

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Table 7-1. Regulations and Guidelines Applicable to Chloromethane (continued)

Agency	Description	Information	References
<u>NATIONAL</u> (cont.)			
Pesticide Chemicals			
	Subpart D-Test Methods for Pesticide Pollutants BAT and NSPS effluent limitations for priority pollutants for direct discharge point sources that use end-of-pipe biological treatment Daily maximum Monthly average	190 µg/L 86 µg/L	40 CFR 455.50, Table 4 EPA 1993b
	BAT and NSPS effluent limitations for priority pollutants for direct discharge point sources that do not use end-of-pipe biological treatment Daily maximum Monthly average	295 µg/L 110 µg/L	40 CFR 455.50, Table 5 EPA 1993b
	PSES and PSNS for priority pollutants Daily maximum Monthly average	295 µ/L 110 µg/L	40 CFR 455.50, Table 6 EPA 1993b
EPA OW	Ambient Water Quality Criteria For the Protection of Human Health:		EPA 1980
	Ingestion of water and aquatic organisms	1.4 mg/L	
	Ingestion of aquatic organisms only	3.28 mg/L	
c. Other:			
DOT	Hazardous Materials Table	UN 1975	49 CFR 172.101 DOT 1990a
	Hazardous substances other than radio nuclides: RQ	1000 pounds (454 kg)	49 CFR 172.101, Appendix A DOT 1990b
EPA-OERR	List of Hazardous Substances and Reportable Quantities Statutory	1 pound	40 CFR 302.4 EPA 1985
	Final RQ	100 pounds (45.4 Kg)	
	Toxic Chemical Release Reporting: Community Right-to-know		
	Specific toxic Chemical Listings	Yes	40 CFR 372.65 EPA 1988c

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Table 7-1. Regulations and Guidelines Applicable to Chloromethane (continued)

Agency	Description	Information	References	
NATIONAL (cont.)				
EPA-OSW	Criteria for Municipal Solid Waste Landfills			
	Constituents for detection monitoring	Yes	40 CFR 258, Appendix I EPA 1991a	
	List of hazardous inorganic and organic constituents	Yes	40 CFR 258, Appendix II EPA 1991b	
	Lists of Hazardous Wastes			
	Hazardous wastes from non-specific sources- F024, F025 wastes	Yes	40 CFR 261.31 EPA 1981c	
	Chemical analysis methods	Yes	40 CFR 261, Appendix III EPA 1983c	
	Basis for listing hazardous waste	Yes	40 CFR 261, Appendix VII EPA 1981d	
	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities			
	Ground-water monitoring list	Yes	40 CFR 264, Appendix IX EPA 1987n	
	Land Disposal Restrictions-			
	Waste prohibitions-solvent wastes	Yes	40 CFR 268.30 EPA 1988b	
	Treatment standards for hazardous waste--Technical amendment of final rule (40 CFR 268.40; waste code F039)	<u>Wastewater</u> 0.19 mg/L <u>Nonwastewater</u> 30 mg/kg	62 FR 7502 EPA 1997	
	Universal treatment standards-- Technical amendment of final rule (40 CFR 268.48)	<u>Wastewater</u> 0.19 mg/L <u>Nonwastewater</u> 30 mg/kg		
Land Disposal Restrictions for Newly Identified and Listed Hazardous Wastes and Hazardous Soil (proposed rule)	Yes	58 FR 48092 EPA 1993c		
EPA OPPTS	Chemical Information Rules			
	Chemical lists and reporting periods	Yes	40 CFR 712.30 EPA 1982c	
	Health and Safety Data Reporting			
Affected substances and mixtures	Yes	40 CFR 716.120 EPA 1988d		

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Agency	Description	Information	References
<u>NATIONAL</u> (cont.)			
Guidelines:			
a. Air:			
ACGIH	Ceiling Limit for Occupation Exposure		
	TLV-TWA (skin)	50 ppm 103 mg/m ³	ACGIH 1996
	TLV-STEL (skin)	100 ppm (207 mg/m ³)	
NIOSH	Recommended Exposure Limit for Occupation Exposure--Time-weighted average (TWA)-up to 10 hours per 40-hour workweek	lowest feasible concentration (1.6 LOQ)	NIOSH 1992
b. Water:			
EPA ODW	1-d Health Advisory (child)	9 mg/L	EPA 1996a
	10-d Health Advisory (child)	0.4 mg/L	
	Lifetime Health Advisory (adult)	0.003 mg/L	
	Longer-term Health Advisory.	0.4 mg/L (child) 1 mg/L (adult)	
	RfD	0.004 mg/kg/d	
d. Other:			
ACGIH	Carcinogenicity Designation (Proposed)	A4 ^c	ACGIH 1996
EPA	Cancer Classification	C	EPA 1996a
	RfD	0.004 mg/kg/day	
	DWEL	0.1 mg/L	
<u>STATE</u>			
Regulations and Guidelines:			
a. Air:			
	Average Acceptable Ambient Air Concentrations		NATICH 1992
AZ	1 hour	3.6x10 ⁺¹ µg/m ³ (0.017 ppm)	
	24 hour	9.5 µg/m ³ (0.005 ppm)	
	Annual	2.6x10 ⁻² µg/m ³ (0.013 ppb)	
CT	8 hour	2.10x10 ⁺³ µg/m ³ (1.02 ppm)	
FL-FtLdle	8 hour	1.10 mg/m ³ (0.053 ppm)	
FL-Pinella	8 hour	1.05 x10 ⁺³ µg/m ³ (1.02 ppm)	
	24 hour	2.52 x10 ⁺² µg/m ³ (0.122 ppm)	

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Table 7-1. Regulations and Guidelines Applicable to Chloromethane (continued)

Agency	Description	Information	References
<u>STATE (cont.)</u>			
KS	Annual	7.14 $\mu\text{g}/\text{m}^3$ (0.003 ppm)	
KS-KC	Annual	7.14 $\mu\text{g}/\text{m}^3$ (0.003 ppm)	
KY	8 hour	5.25 mg/m^3 (2.54 ppm)	State of Kentucky 1986
LA	Annual	5.56×10^{-1} $\mu\text{g}/\text{m}^3$ (0.027 ppm)	
ME	15 minutes	2.10×10^{-4} $\mu\text{g}/\text{m}^3$ (10.17 ppm)	
	24 hour	1.70×10^{-3} $\mu\text{g}/\text{m}^3$ (0.823 ppm)	
MI	Annual	1.6 $\mu\text{g}/\text{m}^3$ (0.001 ppm)	NATICH 1992
ND	1 hour	2.07 mg/m^3 (4.27 ppm)	
	8 hour	1.03 mg/m^3 (0.499 ppm)	
NV	8 hour	2.50 mg/m^3 (1.21 ppm)	
NY	1 year	2.10×10^{-3} $\mu\text{g}/\text{m}^3$ (1.017 ppm)	
OK	24 hour	1.05×10^{-3} $\mu\text{g}/\text{m}^3$ (0.508 ppm)	
PA-Phil.	1 year	2.52×10^{-3} $\mu\text{g}/\text{m}^3$ (1.22 ppm)	
	Annual	1.20×10^{-3} ppb (2.48×10^3 $\mu\text{g}/\text{m}^3$)	
TX	30 minutes	1.03×10^{-3} $\mu\text{g}/\text{m}^3$ (0.499 ppm)	
	Annual	1.03×10^{-2} $\mu\text{g}/\text{m}^3$ (0.050 ppm)	
VA	24 hour	1.70×10^{-3} $\mu\text{g}/\text{m}^3$ (0.823 ppm)	
VT	Annual	1.00×10^{-2} $\mu\text{g}/\text{m}^3$ (0.005 ppb)	
WA-SWEST	24 hour	3.50×10^{-2} $\mu\text{g}/\text{m}^3$ (0.169 ppm)	
b. Water			
	Water Quality Criteria: Human Health		
AZ	Drinking water	0.50 $\mu\text{g}/\text{L}$	NATICH 1988
AZ	Drinking water (guideline)	0.19/L	FSTRAC 1990
KS	Drinking water (guideline)	0.19 $\mu\text{g}/\text{L}$	

^a Group 3 = The IARC working group has concluded that chloromethane is not classifiable as to its carcinogenicity to humans.

^b A U.S. Court of Appeals rescinded the 1989 PELs promulgated by OSHA. Only PELs in place prior to the 1989 rule are currently allowed.

^c A4 = Not classifiable as a human carcinogen: there are inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

BAT = Best Available Technology Economically Achievable; BEI = Biological Exposure Indices; DWEL = Drinking Water Equivalent Level; EPA = Environmental Protection Agency; FSTRAC = Federal State Toxicology and Regulatory Alliance committee; GC/MS = Gas Chromatography/Mass Spectroscopy; IARC = International Agency for Research on Cancer; LOQ = Limits of Quantitation; MCL = Maximum Contaminant Level; MCLG = Maximum Contaminant Level Goal; NIOSH = National Institute of Occupational Safety and Health; NPDES = National Pollution Discharge Elimination System; NSPS = New Source Performance Standards; OAR = Office of Air and Radiation; ODW = Office of Drinking Water; OERR = Office of Emergency and Remedial Response; OSHA = Occupational Safety and Health Administration; OSW = Office of Solid Wastes; PEL = Permissible Exposure Limit; PSES = Pretreatment Standards for Existing Sources; RfD = Reference Dose; RQ = Reportable Quantities; SOCM = Synthetic Organic Chemicals Manufacturing Industry; STEL = Short-term exposure Limit; TLV = Threshold Limit Value; TWA = Time-weighted Average; VOC = Volatile Organic Compound; WHO = World Health Organization

