

US EPA ARCHIVE DOCUMENT

Technical Factsheet on: 1,2,4-TRICHLOROBENZENE

[List of Contaminants](#)

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

Drinking Water Standards

MCLG: 0.07 mg/L

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HAL(child): 1 day: 0.1 mg/L; Longer term: 0.1 mg/L

Health Effects Summary

Acute: EPA has found 1,2,4-trichlorobenzene to potentially cause the following health effects from acute exposures at levels above the MCL: changes in liver, kidneys and adrenal glands

Drinking water levels which are considered "safe" for short-term exposures: For a 10-kg (22 lb.) child consuming 1 liter of water per day: upto a 7-year exposure to 0.1 mg/L.

Chronic: 1,2,4-Trichlorobenzene has the potential to cause the following health effects from long-term exposures at levels above the MCL: increased adrenal gland weights

Cancer: There is presently no evidence that 1,2,4-Trichlorobenzene has the potential to cause cancer from a lifetime exposure in drinking water.

Usage Patterns

Current production figures on 1,2,4-trichlorobenzene are not available. EPA estimated 1983 production to be in the range of 3 to 8 million lbs. 1983 imports were reportedly over 3 million lbs.

1,2,4-Trichlorobenzene is primarily used as a dye carrier. Other uses include: an intermediate in the manufacture of herbicides and higher chlorinated benzenes; dielectric fluid; solvent; heat-transfer medium; degreasing agents; septic tank and drain cleaners; wood preservatives; and abrasive formulations. It was once used as a soil treatment for termite control.

Release Patterns

Major environmental releases of 1,2,4-trichlorobenzene are due to its manufacture and use as a dye carrier. 1,2,4-Trichlorobenzene is also a product of hexachlorobenzene dechlorination by anaerobic sewage sludge.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, 1,2,4- trichlorobenzene releases to land and water totalled over 180,000 lbs., of which about 87% was to water. These releases were primarily from textile finishing industries. The largest releases occurred in North Carolina and Virginia.

Environmental Fate

If 1,2,4-trichlorobenzene (1,2,4-TCB) is released to the soil it will probably adsorb to the soil and therefore will not leach appreciably to the groundwater. However, 1,2,4-TCB has been detected in some groundwater samples which indicates that it can be transported there by some process. 1,2,4-TCB will not hydrolyze or biodegrade in groundwater, but it may biodegrade slowly in the soil based upon the data from one experiment.

If released to water it will adsorb to the sediments. It will not hydrolyze in surface waters but it may be subject to significant biodegradation. It is expected to significantly evaporate from water with half-lives of 11-22 days for evaporation from a seawater microcosm and a half-life of 4.2 hr predicted for evaporation from a model river. Adsorption to sediments or absorption by microorganisms may minimize the rate of evaporation. A half-life of 450 years has been reported for sunlight photolysis in surface waters at 40 deg latitude in summer.

If 1,2,4-trichlorobenzene is released to the atmosphere, it may react with photochemically produced hydroxyl radicals with a resulting estimated vapor phase half-life in the atmosphere of 18.5 days.

Bioconcentration in aquatic organisms has been measured and values for fish ranging from 51 to 2800 have been reported.

Exposure to 1,2,4-trichlorobenzene will result mainly from occupational exposure during its manufacture and use, while general population exposure will result from the ingestion of contaminated drinking water and food, especially contaminated fish.

Chemical/Physical Properties

CAS Number: 120-82-1

Color/ Form/Odor: Aromatic, colorless liquid

M.P.: 17 C B.P.: 213.5 C

Vapor Pressure: 0.29 mm Hg at 25 C

Octanol/Water Partition (Kow): Log Kow = 4.02

Density/Spec. Grav.: 1.45 at 20 C

Solubility: 30 mg/L of water at 20 C; Slightly soluble in water

Soil sorption coefficient: Koc ranges from 1000 to 5000; moderate to high mobility in soil

Odor/Taste Thresholds: Odor threshold in water is 3 mg/L

Bioconcentration Factor: BCFs range from 490 to 2800 in fish; expected to bioconcentrate in aquatic organisms.

Henry's Law Coefficient: 3.9×10^{-3} atm-cu m/mole

Trade Names/Synonyms: 1,2,4-Trichlorobenzol, Hostetex L-PEC

Other Regulatory Information

Monitoring:

-- For Ground/Surface Water Sources:

Initial Frequency- 4 quarterly samples every 3 years

Repeat Frequency- Annually after 1 year of no detection

-- Triggers - Return to Initial Freq. if detect at > 0.0005 mg/L

Analysis

Reference Source

EPA 600/4-88-039

Method Numbers

502.2; 524.2

Treatment - Best Available Technologies: Granular Activated Charcoal and Packed Tower Aeration

Toxic Release Inventory - Releases to Water and Land, 1987 to 1993 (in pounds):

TOTALS (in pounds)	Water		Land
Top Five States*	157,541		22,835
NC	80,253	13,209	
VA	36,970	0	
GA	17,639	8,951	
WV	20,300	0	
NY	1,150	1	
Major Industries*			
Finishing plants, misc	52,249		0
Finishing plants, synth.	47,976		0
Weaving, finishing mills	20,139		8,951
Alkalies, chlorine	21,773		1
Knitting mills, misc	9,077		9,994
Knit outerwear mills	1,300		3,200

* Water/Land totals only include facilities with releases greater than 100 lbs.

For Additional Information

EPA can provide further regulatory or other general information:

EPA Safe Drinking Water Hotline - 800/426-4791

Other sources of toxicological and environmental fate data include:

Toxic Substance Control Act Information Line - 202/554-1404

Toxics Release Inventory, National Library of Medicine - 301/496-6531

Agency for Toxic Substances and Disease Registry - 404/639-6000