

US EPA ARCHIVE DOCUMENT

Technical Factsheet on: CHLOROBENZENE

[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: 0.1 mg/L

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HAL: 1 to 10 day: 2 mg/L; Longer-term: 2 mg/L

Health Effects Summary

Acute: EPA has found chlorobenzene to potentially cause anesthetic effects and impaired liver and kidney function from short-term exposures at levels above the MCL.

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 2 mg/L.

Chronic: Chlorobenzene has the potential to cause liver, kidney and central nervous system damage from long-term exposure at levels above the MCL.

Cancer: There is inadequate evidence to state whether or not chlorobenzene has the potential to cause cancer from a lifetime exposure in drinking water.

Usage Patterns

Production of chlorobenzene in 1988 was 270 million pounds, and was expected to decrease. Uses of chlorobenzene include: an intermediate in the manufacture of other organic chemicals, dyestuffs and insecticides (60%); as a solvent for adhesives, drugs, rubber, paints and dry-cleaning (30%); miscellaneous uses include fiber-swelling agent in textile processing.

Release Patterns

Major environmental releases of chlorobenzene are due to its use as a solvent in pesticides. From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, chlorobenzene releases to water totalled over 326,000 lbs. Releases to land totalled nearly 37,000 lbs. These releases were primarily from alkali and chlorine industries which use chlorobenzene in chlorination processes. Most of these releases occurred in West Virginia.

Environmental Fate

Chlorobenzene will enter the atmosphere from fugitive emissions connected with its use as a solvent in pesticide formulations and as an industrial solvent. Once released it will decrease in concentration due to dilution and photooxidation.

Releases into water and onto land will dissipate due to vaporization into the atmosphere and slow biodegradation in the soil or water.

It is relatively mobile in sandy soil and aquifer material and biodegrades very slowly or not at all in these soils. Therefore, it can be expected to leach into the groundwater. It has a moderate adsorption onto organic soil. If retained long enough, a large number of soil bacteria and fungi are capable of degrading chlorobenzene and mineralizing it. 2- and 4-chlorophenol are products of this biodegradation. Degradation will generally be slow, but fairly rapid mineralization (20%/week) has been reported in one study. Acclimation of soil microorganisms to hydrocarbon metabolism is an important factor.

In water, the primary loss will be due to evaporation, with a half-life estimated at up to 10 to 11 hours, depending on the wind speed and water movement. The half-life for evaporation is approximately 4.5 hours with moderate wind speed.

Biodegradation will occur during the warmer seasons and will proceed more rapidly in fresh water than in estuarine and marine systems. Again, acclimation of soil microorganisms is important. A moderate amount of adsorption will occur onto organic sediments.

Little bioconcentration is expected into fish and food products. Log BCF is 1 to 2 for several species of fish.

Primary human exposure is from ambient air, especially near point sources.

Chemical/Physical Properties

CAS Number: 108-90-7

Color/ Form/Odor: Colorless liquid with a faint, almond-like, aromatic odor

M.P.: -45.6 C B.P.: 132 C

Vapor Pressure: 11.8 mm Hg at 25 C

Octanol/Water Partition (Kow): Log Kow = 2.18 to 2.84

Density/Spec. Grav.: 1.11 at 20 C

Solubilities: 0.45 g/L in water

Soil sorption coefficient: N/A

Odor/Taste Thresholds: N/A

Bioconcentration Factor (BCF): Log BCF = 1 to 2 in fish; not significant

Henry's Law Coefficient: 0.00356 atm-cu m/mole (calculated)

Trade Names/Synonyms: Benzene chloride, Chlorbenzol, Monochlorobenzene, Phenyl chloride, IP Carrier T 40, Tetrosin SP

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* | 326,017 | 36,910 |
| WV | 262,653 | 263 |
| OH | 20,598 | 12,500 |
| NJ | 13,710 | 13,261 |
| LA | 16,460 | 265 |
| SC | 1,401 | 5,939 |
| Major Industries | | |
| Alkalis, chlorine | 261,058 | 67 |
| Plastics, resins | 23,756 | 13,312 |
| Cyclic crudes, dyes | 21,657 | 6,637 |
| Indus. organics | 13,460 | 9,375 |
| Gum, wood chems | 0 | 4,909 |

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 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