

Technical Factsheet on: HEXACHLOROCYCLOPENTADIENE (HEX)

[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: 0.05 mg/L

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HAL(child): none

Health Effects Summary

Acute: EPA has found hexachlorocyclopentadiene (HEX) to potentially cause the following health effects from acute exposures at levels above the MCL: gastrointestinal distress; damage to liver, kidneys and heart.

At present, EPA has issued no drinking water health advisory providing guidance on safe levels for short-term exposures to this chemical in drinking water.

Chronic: HEX has the potential to cause the following health effects from long-term exposures at levels above the MCL: damage to the stomach and kidneys.

Cancer: There is no evidence that HEX has the potential to cause cancer from a lifetime exposure in drinking water.

Usage Patterns

It has been estimated that between 8 and 15 million lbs. of HEX are produced each year.

Its greatest use is as an intermediate in chemical manufacture, including the synthesis of chlorinated pesticides, flame retardants, resins, dyes, pharmaceuticals, plastics, etc. HEX has no end uses of its own.

Release Patterns

Major sources of release of hexachlorocyclopentadiene to the environment are emissions and contaminated wastewater from facilities which manufacture or use this compound as a chemical intermediate, and from the application of pesticides where it may remain as an impurity. Other sources are air emissions from the incineration of certain chlorinated wastes, and from water treatment plants receiving contaminated wastestreams.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, HEX releases to land and water totalled only 78 lbs., all of which was to water. These releases were primarily from alkalis and chlorine industries. The largest releases occurred in New York.

Environmental Fate

Hexachlorocyclopentadiene is not a persistent environmental contaminant. If released to soil, it is predicted to be relatively immobile. In moist soil, this compound would be subject to breakdown by light and chemical reaction (half-life hours to weeks). Volatilization from soil surfaces is expected to be minor.

If released to water, this compound will degrade within minutes to hours primarily by photolysis and chemical hydrolysis. Though HEX can adsorb to sediments, this does not slow its rate of degradation. Volatilization from water is expected to be a significant removal mechanism, although high turbidity could extend the half-life to several weeks. Biodegradation is expected to be of minor importance.

Hexachlorocyclopentadiene could potentially bioaccumulate in some aquatic organisms depending upon the species. Bioconcentration factors of hexachlorocyclopentadiene in a laboratory model ecosystem: alga, 341; snail, 929; mosquito, 1634; and fish, 448.

Chemical/ Physical Properties

CAS Number: 77-47-4

Color/ Form/Odor: dense, oily, yellow green liquid with a pungent odor.

M.P.: -9 C B.P.: 239 C

Vapor Pressure: 0.08 mm Hg at 25 C

Octanol/Water Partition (Kow): Log Kow = 3.99

Density/Spec. Grav.: 1.7 at 25 C

Solubility: 2 m/L of water at 25 C; Insoluble in water

Soil sorption coefficient: Koc measured at 4,265; low mobility in soil

Odor/Taste Thresholds: N/A

Bioconcentration Factor: BCFs range from 100 to 1230 in fish; some potential to bioconcentrate in aquatic organisms.

Henry's Law Coefficient: 2.7×10^{-2} atm-cu m/mole;

Trade Names/Synonyms: HEX, Hexachloropentadiene

Other Regulatory Information

Monitoring For Ground/Surface Water Sources:

Initial Frequency- 4 quarterly samples every 3 years

Repeat Frequency- If no detections during initial round:

2 quarterly per year if serving >3300 persons;

1 sample per 3 years for smaller systems

Triggers - Return to Initial Freq. if detect at > 0.0002 mg/L

Analysis:

Reference Source Method Numbers

EPA 600/4-88-039 505; 508; 508.1; 525.2

Treatment- Best Available Technologies:
Granular Activated Charcoal

For Additional Information:

EPA can provide further regulatory and 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
National Pesticide Hotline - 800/858-7378