

Technical Factsheet on: ENDRIN

[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: 0.002 mg/L

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HAL(child): 1- to 10-day: 0.02 mg/L; Longer term: 0.003 mg/L

Health Effects Summary

Acute: EPA has found endrin to potentially cause the following health effects from acute exposures at levels above the MCL: tremors, labored breathing, mental confusion, convulsions.

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 ten-day exposure to 0.02 mg/L or up to a 7-year exposure to 0.003 mg/L.

Chronic: Endrin has the potential to cause the following health effects from long-term exposures at levels above the MCL: convulsions and damage to liver tissue.

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

Usage Patterns

Endrin is an aliphatic chlorinated insecticide which has been used mainly on field crops such as cotton, maize, sugarcane, rice, cereals, ornamentals, and other crops. It has also been used for grasshoppers in non-cropland and to control voles and mice in orchards.

Once widely used in the US, most uses were cancelled in 1980. Production in 1980 was reported to be 100,000 lbs.

Release Patterns

Endrin's former source in the environment is from use as an insect, bird and rat-killer. It has been used on agricultural crops, cotton seeds, control of birds on buildings and mice in orchards. Its major use has been on cotton crops. The U.S. EPA presently considers the pesticide cancelled.

Environmental Fate

Endrin is very persistent, but it is known to photodegrade to delta-ketoendrin (half-life 7 days - June). Endrin released to soils will persist for extremely long periods of time (up to 14 yr or more). Biodegradation may be enhanced somewhat in flooded soils or under anaerobic conditions. Its low water solubility and strong adsorption to soil makes leaching into groundwater unlikely. However, the detection of endrin in certain groundwater samples suggest that leaching may be possible in some soils. Endrin's low vapor pressure suggests only limited evaporation from soil. However, several studies have suggested that moderate to extensive loss of endrin from soils and crops was due to evaporation. Runoff from rain or irrigation of particle-associated endrin will carry particle-associated endrin to water systems.

Endrin released to water systems will not hydrolyze or biodegrade. It will be subject to photoisomerization to ketoendrin. It will extensively sorb to sediment. Evaporation from water will not be significant.

Fate of endrin in the atmosphere is unknown, but it probably will be primarily associated with particulate matter and be removed mainly by rainout and dry deposition.

There is significant bioconcentration of endrin in fish, with BCFs of 1335-10,000 reported. In addition, there is moderate to extensive bioconcentration in shellfish (BCF of 500-1250) and in snails (BCF of 49,000).

Monitoring data demonstrates that endrin continues to be a contaminant in air, water, sediment, soil, fish, and other aquatic organisms. Human exposure appears to come mostly from food or occupational exposure.

Chemical/ Physical Properties

CAS Number: 72-20-8

Color/ Form/Odor: Odorless white crystals

M.P.: 200 C B.P.: decomp. 245 C

Vapor Pressure: 2×10^{-7} mm Hg at 25 C

Octanol/Water Partition (Kow): Log Kow = 5.6(calc.)

Density/Spec. Grav.: 1.7 at 20 C

Solubility: 0.2 mg/L of water; Slightly soluble in water

Soil sorption coefficient: $K_{oc} = 34,000$ (est); low mobility in soil

Odor/Taste Thresholds: N/A

Bioconcentration Factor: 1335 to 10,000 in fish; expected to bioconcentrate in aquatic organisms.

Henry's Law Coefficient: 4×10^{-7} atm-cu m/mole

Trade Names/Synonyms: Nendrin; EN 57; Endrex; Endricol; Hexadrin; Mendrin; Oktanex; Compound 269; Hexachloroepoxy- octahydro-endo,endo-dimethano- naphthalene

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 > 0.00001 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