

# Technical Factsheet on: p-DICHLOROBENZENE

## [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: 0.075 mg/L

MCL: 0.075 mg/L

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

### **Health Effects Summary**

Acute: May cause nausea, vomiting, headaches, and irritation of the eyes and respiratory tract.

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 10 mg/L.

Chronic: p-DCB has the potential to cause the following health effects from long-term exposures at levels above the MCL: anemia, skin lesions, appetite loss, yellow atrophy of the liver and adverse blood effects.

Cancer: There is some evidence that p-DCB has the potential to cause cancer from a lifetime exposure at levels above the MCL.

### **Usage Patterns**

Available production data on p-DCB shows a decreasing trend down to 15 million lbs. in 1981. Demand however, was at 74 million lbs in 1986; rose to 77 million lbs. the following year, and was projected to continue increasing.

p-Dichlorobenzene is used as an insecticidal fumigant against clothes moths (35-40%); as a deodorant for garbage and restrooms (35-40%); as an insecticide for control of fruit borers and ants; may be applied to tobacco seed beds for blue mold control; for the control of peach tree borer; and mildew and mold on leather and fabrics.

It is also used as an intermediate in the manufacture of other organic chemicals such as 2,5-dichloroaniline, and in plastics, dyes, pharmaceuticals.

### **Release Patterns**

Chemical waste dump leachates and direct manufacturing effluents are reported to be the major source of pollution of the chlorobenzenes (including the dichlorobenzenes) to Lake Ontario. The major source of p-dichlorobenzene emission to the atmosphere is volatilization from use in toilet bowl deodorants, garbage deodorants and moth flakes.

In 1972, 70-90% of the annual USA production of p-dichlorobenzene was estimated to have been released into the atmosphere primarily as a result of use in toilet bowl and garbage deodorants and use in moth control as a fumigant.

In 1984 it was reported that 67% of the p-dichlorobenzene consumed in the USA is used for space deodorants and moth control with 33% used as an intermediate for polyphenylene sulfide resin production; volatilization from the deodorants and moth flakes will therefore be the major emission source to the atmosphere.

From 1987 to 1993, according to the Toxic Release Inventory, p-DCB releases to water totalled almost 34,000 lbs. Releases to land totalled nearly 4,500 lbs. These releases were primarily from a single chemical manufacturing plant in West Virginia.

### **Environmental Fate**

If released to soil, p-dichlorobenzene can be moderately to tightly adsorbed. Leaching from hazardous waste disposal areas has occurred and the detection of p-dichlorobenzene in various groundwaters indicates that leaching can occur. Volatilization from soil surfaces may be an important transport mechanism. It is possible that p-dichlorobenzene will be slowly biodegraded in soil under aerobic conditions. Chemical transformation by hydrolysis, oxidation or direct photolysis are not expected to occur in soil.

If released to water, volatilization may be the dominant removal process. The volatilization half-life from a model river one meter deep flowing one meter/sec with a wind velocity of 3 m/sec is estimated to be 4.3 hours at 20 deg C. Adsorption to sediment will be a major environmental fate process based upon extensive monitoring data in the Great Lakes area and Koc values based upon monitoring samples. Analysis of Lake Ontario sediment cores has indicated the presence and persistence of p-dichlorobenzene since before 1940. Adsorption to sediment will attenuate volatilization. Aerobic biodegradation in water may be possible, however, anaerobic biodegradation is not expected to occur.

Aquatic hydrolysis, oxidation and direct photolysis are not expected to be important. If released to air, p-dichlorobenzene will exist predominantly in the vapor-phase and will react with photochemically produced hydroxyl radicals at an estimated half-life rate of 31 days in typical atmosphere. Direct photolysis in the troposphere is not expected to be important. The detection of p-dichlorobenzene in rain-water suggests that atmospheric wash-out is possible.

For the most part, experimental BCF values reported in the literature are less than 1000 which suggests that significant bioconcentration will not occur; however, a BCF of 1800 was determined for guppies in one study.

General population exposure to p-dichlorobenzene may occur through oral consumption of contaminated drinking water and food (particularly fish) and through inhalation of contaminated air.

### **Chemical/Physical Properties**

CAS Number: 106-46-7

Color/ Form/Odor: White crystals with distinctive aromatic, mothball-like odor

M.P.: 53.1 C B.P.: 174 C

Vapor Pressure: 10 mm Hg at 54.8 C

Octanol/Water Partition (Kow): Log Kow = 3.37

Density/Spec. Grav.: 1.25 g/ml at 20 C

Solubilities: 65.3 mg/L of water at 25 C

Soil sorption coefficient: Koc estimates range from 409 to 1514

Odor/Taste Thresholds: N/A

Bioconcentration Factor (BCF): Low; Ranges from 100 to 250 in various species

Henry's Law Coefficient: 0.0015 atm-cu m/mole at 20 C

Trade Names/Synonyms: Paradichlorobenzene; Paradichlorobenzol; Paramoth; Di-Chloricide; Paradi; Paradow; Persia-Perazol; Evola; Parazene

### 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):

	Water		Land
<b>TOTALS (in pounds)</b>	<b>33,675</b>		<b>4,482</b>
<b>Top Five States*</b>			
WV	27,676	0	
TX	1,280	3,132	
DE	1,870	200	
GA	750	0	
LA	503	0	
<b>Major Industries</b>			
Alkalies, chlorine	27,676		0
Industrial org. chem.	3,076		3,350
Agricultural chem.	750		0
Cyclic crudes, intermed.	600		0

\* 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