

United States
Environmental Protection
Agency

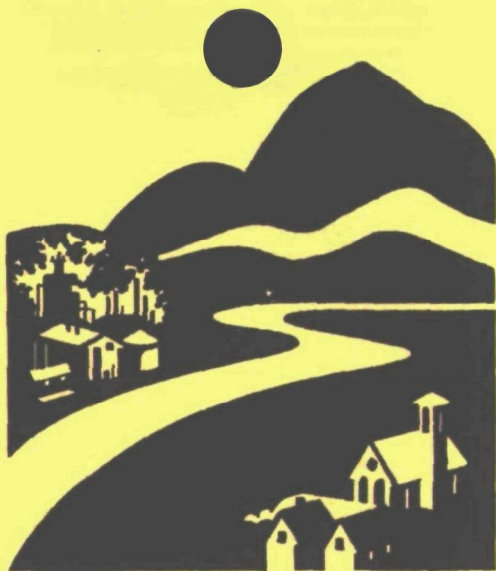
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Office of Pollution Prevention and Toxics (7401)

EPA Chemicals in the Environment

CHLORINE

(CAS NO. 7782-50-5)



Chemicals can be released to the environment as a result of their manufacture, processing, and use. The EPA has developed information summaries on selected chemicals to describe how you might be exposed to these chemicals, how exposure to them might affect you and the environment, what happens to them in the environment, who regulates them, and whom to contact for additional information. EPA is committed to reducing environmental releases of chemicals through source reduction and other practices that reduce creation of pollutants.

WHAT IS CHLORINE, HOW IS IT USED, AND HOW MIGHT I BE EXPOSED?

Chlorine is a highly reactive gas. It is a naturally occurring element. Chlorine is produced in very large amounts (23 billion pounds in 1992) by eighteen companies in the United States. US demand for chlorine is expected to increase slightly over the next several years and then decline. The expected decline in US demand is due to environmental concerns for chlorinated organic chemicals. The largest users of chlorine are companies that make ethylene dichloride and other chlorinated solvents, polyvinyl chloride (PVC) resins, chlorofluorocarbons, and propylene oxide. Paper companies use chlorine to bleach paper. Water and wastewater treatment plants use chlorine to reduce water levels of microorganisms that can

spread disease to humans.

Exposure to chlorine can occur in the workplace or in the environment following releases to air, water, or land. People who use laundry bleach and swimming pool chemicals containing chlorine products are usually not exposed to chlorine itself. Chlorine is generally found only in industrial settings. Chlorine enters the body breathed in with contaminated air or when consumed with contaminated food or water. It does not remain in the body due to its reactivity.

WHAT HAPPENS TO CHLORINE IN THE ENVIRONMENT?

Chlorine dissolves when mixed with water. It can also escape from water and enter air under certain conditions. Most direct releases of chlorine to the environment are to air and to surface water. Once in air or in water, chlorine reacts with other chemicals. It combines with inorganic material in water to form chloride salts. It combines with organic material in water to form chlorinated organic chemicals. Because of its reactivity chlorine is not likely to move through the ground and enter groundwater. Plants and animals are not likely to store chlorine.

HOW DOES CHLORINE AFFECT HUMAN HEALTH AND THE ENVIRONMENT?

Effects of chlorine on human health

and the environment depend on how much chlorine is present and the length and frequency of exposure. Effects also depend on the health of a person or condition of the environment when exposure occurs.

Breathing small amounts of chlorine for short periods of time adversely affects the human respiratory system. Effects range from coughing and chest pain to water retention in the lungs. Chlorine irritates the skin, the eyes, and the respiratory system. These effects are not likely to occur at levels of chlorine that are normally found in the environment.

Human health effects associated with breathing or otherwise consuming small amounts of chlorine over long periods of time are not known. They are currently under investigation. Some studies show that workers develop adverse effects from repeat inhalation exposure to chlorine, but others do not. Laboratory studies show that repeat exposure to chlorine in air can adversely affect the immune system, the blood, the heart, and the respiratory system of animals.

Chlorine causes environmental harm at low levels. Chlorine is especially harmful to organisms living in water and in soil.

WHAT EPA PROGRAM OFFICES REGULATE CHLORINE, AND UNDER WHAT LAWS IS IT REGULATED?

EPA OFFICE	LAW	PHONE NUMBER
Pollution Prevention & Toxics	Toxic Substances Control Act	(202) 554-1404
	Emergency Planning and Community Right-to-Know Act (EPCRA): Regulations (§ 313)	(800) 535-0202
	Toxics Release Inventory data	(202) 260-1531
Air	Clean Air Act	(919) 541-0888
Pesticide Programs	Federal Insecticide, Fungicide and Rodenticide Act	(800) 858-7378
Solid Waste & Emergency Response	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)	(800) 535-0202
	Resource Conservation and Recovery Act / EPCRA (§ 304/311/312)	
Water	Clean Water Act	(202) 260-7588

A technical support document is available from the TSCA Assistance Information Service, (202) 554-1404.

WHAT OTHER FEDERAL AGENCIES OR GROUPS CAN I CONTACT FOR INFORMATION ON CHLORINE?

AGENCY/GROUP	PHONE NUMBER
Agency for Toxic Substances and Disease Registry	(404) 639-6000
American Conference of Governmental Industrial Hygienists	(513) 742-2020
Consumer Product Safety Commission	(301) 504-0994
Food and Drug Administration	(301) 443-3170
National Institute for Environmental Health Sciences (EnviroHealth Clearinghouse)	(800) 643-4794
National Institute for Occupational Safety and Health (NIOSH)	(800) 356-4674
Occupational Safety and Health Administration	(Check your local phone book under U.S. Department of Labor)