

United States
Environmental Protection
Agency

EPA 749-F-94-021
December 1994

Office of Pollution Prevention and Toxics (7401)

EPA Chemicals in the Environment

TOLUENE

(CAS NO. 108 88 3)



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 TOLUENE, HOW IS IT USED, AND HOW MIGHT I BE EXPOSED?

Toluene (also called methyl benzene) is a colorless, flammable liquid. It occurs naturally in petroleum crude oil. Petroleum crude oil is by far the largest source of toluene. Most (up to a billion pounds each year) of this toluene is never isolated from crude oil. Refineries pump this "unrecovered" toluene to some other location where it is added directly to gasoline. The toluene that is isolated is "recovered" in large amounts (approximately 800 million gallons in 1991) by twenty companies in the United States. US demand for toluene is expected to grow moderately over the next several years. The largest users of "recovered" toluene are companies that make benzene. Companies also add toluene to aerosol spray paints, wall paints, lacquers, paint strippers, adhesives, printing ink, spot removers, cosmetics, perfumes, and antifreeze.

Exposure to toluene can occur in

the workplace or in the environment following releases to air, water, land, or groundwater. Exposure can also occur when people use gasoline and other products that contain toluene. Toluene enters the body when breathed in with contaminated air or when consumed with contaminated food or water. It can also be absorbed through skin contact. Toluene does not remain in the body due to its breakdown and removal.

WHAT HAPPENS TO TOLUENE IN THE ENVIRONMENT?

Toluene evaporates when exposed to air. It dissolves only slightly when mixed with water. Most direct releases of toluene to the environment are to air. Toluene also evaporates from water and soil exposed to air. Once in air, toluene breaks down to other chemicals. Microorganisms that live in water and in soil can also break down toluene. Because it is a liquid that does not bind well to soil, toluene that makes its way into the ground can move through the ground and enter groundwater. Plants and animals are not likely to store toluene.

HOW DOES TOLUENE AFFECT HUMAN HEALTH AND THE ENVIRONMENT?

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

Breathing large amounts of toluene for short periods of time adversely affects the human nervous system, the kidneys, the liver,

and the heart. Effects range from unsteadiness and tingling in fingers and toes to unconsciousness and death. Direct, prolonged contact with toluene liquid or vapor irritates the skin and the eyes. These effects are not likely to occur at levels of toluene that are normally found in the environment.

Human health effects associated with breathing or otherwise consuming smaller amounts of toluene over long periods of time are not known. Repeatedly breathing large amounts of toluene, such as when "sniffing" glue or paint, can cause permanent brain damage. As a result, humans can develop problems with speech, hearing, and vision. Humans can also experience loss of muscle control, loss of memory, and decreased mental ability. Exposure to toluene can also adversely affect the kidneys. Laboratory animal studies and, in some cases, human exposure studies show that repeat exposure to large amounts of toluene during pregnancy can adversely affect the developing fetus. Other studies show that repeat exposure to large amounts of toluene adversely affects the nervous system, the kidneys, and the liver of animals.

Toluene by itself is not likely to cause environmental harm at levels normally found in the environment. Toluene can contribute to the formation of photochemical smog when it reacts with other volatile organic carbon substances in air.

WHAT EPA PROGRAM OFFICES REGULATE TOLUENE, 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
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
	Safe Drinking Water Act (Drinking Water Standard: 1.0 mg/L)	(800) 426-4791

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 TOLUENE?

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)