Styrene Fact Sheet (CAS No. 100-42-5)

Chemicals can be released to the environment as a result of their

manufacture, processing, and use. 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 STYRENE, HOW IS IT USED, AND HOW MIGHT I BE EXPOSED?

Styrene (also called vinylbenzene) is a flammable, oily liquid. It

is colorless to yellowish in color and has a penetrating odor.

Styrene does not occur naturally. Cigarette smoke and automobile

exhaust contain small amounts of styrene. Styrene is produced in very

large amounts (10 billion pounds in 1993) by nine companies in the

United States. U.S. demand for styrene increased about 12 percent from

1992 to 1993. Demand is likely to increase at a slower rate (2 to 4

percent) for the next several years. The largest users of styrene are

chemical companies that make plastics, synthetic rubber, resins, and

insulators. Acrylonitrile-butadiene-styrene plastics are used in

business machines, luggage, and in construction materials.

Acrylonitrile-styrene plastics are used in automotive and household

goods and in packaging material. Food processing companies use small

amounts of styrene as a flavoring agent in foods such as ice cream and

candy.

Exposure can occur in the workplace or in the environment

following releases to air, water, land, or groundwater. Exposure

can also occur when people breathe air contaminated with

cigarette smoke or automobile exhaust. Styrene enters the body when

people breathe in air or consume food or water contaminated with

styrene. It is less likely to be absorbed through skin contact.

Styrene does not remain in the body due to its breakdown and removal.

WHAT HAPPENS TO STYRENE IN THE ENVIRONMENT?

Styrene evaporates when exposed to air. It dissolves only slightly

when mixed with water. Most releases of styrene to the environment are

to air. It can also evaporate from water and soil exposed to air.

Once in air, styrene breaks down to other chemicals. Microorganisms

that live in water and in soil can also break down styrene. Because it

is a liquid that does not bind well to soil, styrene that makes its way

into the ground can move through the ground and enter groundwater.

Plants and animals are not likely to store styrene.

HOW DOES STYRENE AFFECT HUMAN HEALTH AND THE ENVIRONMENT?

Effects of styrene on human health and the environment depend on how

much styrene 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.

Styrene vapor irritates the eyes, the nose, and the throat. Styrene

vapor can also adversely affect the human nervous system, causing

adverse eye effects. These effects are not likely to occur at levels

of styrene that are normally found in the environment.

Human health effects associated with breathing small amounts of

styrene over long periods of time in the workplace include alterations

in vision, hearing loss and increased reaction times. Other human

health effects associated with exposure to small amounts of styrene

over long periods of time are not known. EPA is currently reviewing

the potential for styrene to cause cancer in humans. Laboratory

studies show that repeated oral exposure to large amounts of styrene

cause cancer and adversely affects the blood and the liver of animals.

Laboratory studies also show that repeated exposure to large amounts of

styrene in air can damage the respiratory system of animals.

Styrene has moderate toxicity to aquatic life. Styrene by itself is

not likely to cause environmental harm at levels normally found in the

environment. Styrene can contribute to smog formation when it reacts

with other volatile substances in air.