

Health Effects

The following health effects are taken from the **Agency for Toxic Substances and Disease Registry (ATSDR)** website www.atsdr.cdc.gov. ATSDR is a division of the Department of Health and Human Services.

Acrylonitrile

How can acrylonitrile affect my health?

Breathing high concentrations of acrylonitrile will cause nose and throat irritation, tightness in the chest, difficulty breathing, nausea, dizziness, weakness, headache, impaired judgment, and convulsions. These symptoms usually disappear when exposure is stopped. If spilled on the skin, acrylonitrile will burn the skin and produce redness and blisters.

Animal studies show effects from breathing acrylonitrile. These effects include irritation to the nasal cavity and lungs, changes in the breathing rate, fluid accumulation in the lungs, weakness, and paralysis. Decreased fertility and birth defects have been observed in some laboratory animals exposed to high concentrations of acrylonitrile in air or drinking water.

There is evidence that children are much more sensitive to acrylonitrile than adults. In a few cases, children have died following exposure to acrylonitrile vapors that caused only minor nose and throat irritation in adults.

How likely is acrylonitrile to cause cancer?

The Department of Health and Human Services (DHHS) has determined that acrylonitrile may reasonably be anticipated to cause cancer in people. Studies of people are inconclusive, while animal studies have shown cancers of the brain and mammary glands.

Acrolein

How can acrolein affect my health?

There is very little information about how exposure to acrolein affects people's health. The information we have indicates that breathing large amounts damages the lungs and could cause death. Breathing lower amounts may cause eye watering and burning of the nose and throat and a decreased breathing rate.

Animal studies show that breathing acrolein causes irritation to the nasal cavity, lowered breathing rate, and damage to the lining of the lungs.

We do not know if eating food or drinking water containing acrolein affects your health. However, animals that swallowed acrolein had stomach irritation, vomiting, stomach ulcers, and bleeding.

How likely is acrolein to cause cancer?

The Department of Health and Human Services (DHHS) has not classified acrolein as to its carcinogenicity. The International Agency for Research on Cancer (IARC) has determined that acrolein is not classifiable as to carcinogenicity in humans. The EPA has stated that the potential carcinogenicity of acrolein cannot be determined based on an inadequate database.

How can acrolein affect children?

In general, children are not likely to be affected by acrolein more than adults. However, children who are sensitive to irritants in the air (such as children with asthma) may be more sensitive to lung irritation from acrolein.

In animal studies, ingestion of very large amounts of acrolein during pregnancy caused reduced birth weights and skeletal deformities in newborns. However, the levels causing these effects were often fatal to the mother.

Carbon Disulfide

How can carbon disulfide affect my health?

At very high levels, carbon disulfide may be life-threatening because of its effects on the nervous system. People who breathed carbon disulfide near an accident involving a railroad car showed changes in breathing and some chest pains.

Some workers who breathed high levels during working hours for at least 6 months had headaches, tiredness, and trouble sleeping. However, these workers may have been exposed to other chemicals besides carbon disulfide. Among workers who breathed lower levels, some developed very slight changes in their nerves.

Studies in animals indicate that carbon disulfide can affect the normal functions of the brain, liver, and heart. After pregnant rats breathed carbon disulfide in the air, some of the newborn rats died or had birth defects.

High concentrations of carbon disulfide have caused skin burns when the chemical accidentally touched people's skin.

How likely is carbon disulfide to cause cancer?

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified carbon disulfide for carcinogenicity.

There are no definitive data in humans or animals that indicate a carcinogenic potential for carbon disulfide.

Styrene

How can styrene affect my health?

If you breathe high levels of styrene for a short time, you're most likely to experience nervous system effects such as depression, concentration problems, muscle weakness, tiredness, and nausea, and possibly eye, nose, and throat irritation.

When animals breathed styrene vapors in short-term studies, they damaged the lining of their noses. Long-term exposure damaged their livers, but there is no evidence that this will occur in people because there is no information on human health effects of breathing low levels for a long time.

There is also little information on human health effects from eating or touching styrene. Animal studies show that ingestion of high levels of styrene over several weeks can cause damage to the liver, kidneys, brain, and lungs. When styrene was applied to the skin of rabbits, it caused irritation.

There is no information as to whether breathing, ingesting, or touching styrene affects fetal development or human reproduction.

In animal studies, short-term exposure to very high levels resulted in some reproductive and developmental effects.

How likely is styrene to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that styrene is possibly carcinogenic to humans.

Several studies of workers have shown that breathing styrene may cause leukemia. There is no information on the carcinogenicity of styrene in people who swallow it or get it on their skin.

Studies in animals that breathed or ate styrene suggest that it is weakly carcinogenic.

1,4-Dichlorobenzene (DCB)

Inhaling the vapor or dusts 1,4-DCB at very high concentrations could be very irritating to your eyes and nose and cause burning and tearing of the eyes, coughing, difficult breathing, and an upset stomach. 1,4-DCB is the only DCB that is commonly used in household products (mainly mothballs and toilet-deodorizer blocks).

Some people reported health problems, such as dizziness, headaches, and liver problems, from very high levels of 1,4-DCB in the home. However, these people used very high amounts of 1,4-DCB products and continued to use the products for months or even years, even though they felt ill. People who ate 1,4-DCB products regularly for long periods (months to years) because of its sweet taste developed skin blotches and problems with red blood cells, such as anemia (iron poor blood). Little information is available about the effects of skin contact with DCBs. 1,4-DCB might cause a burning feeling in your skin if you hold mothballs or toilet-deodorizer blocks against your skin for

a long time. Breathing or eating any of the DCBs caused harmful effects in the liver of laboratory animals.

There is no clear evidence that 1,2-DCB and 1,4-DCB impair reproduction or fetal development in animals at levels below those that also cause serious health effects in the mother, although there is an indication that 1,4-DCB can affect development of the nervous system after birth. Lifetime exposure to 1,4-DCB by breathing or eating induced liver cancer in mice. 1,2-DCB was not carcinogenic in laboratory animals, and 1,3-DCB has not been tested for its potential to cause cancer. The animal studies suggest that 1,4-DCB could play a role in the development of cancer in humans, but we do not definitely know this. The U.S. Department of Health and Human Services (DHHS) has determined that 1,4-DCB might be a human carcinogen. The International Agency for Research on Cancer (IARC) determined that 1,4-DCB is possibly carcinogenic to humans. Both IARC and the EPA concluded that 1,2-DCB and 1,3-DCB are not classifiable as to human carcinogenicity.