

US EPA ARCHIVE DOCUMENT

Acenaphthene

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What is acenaphthene?

Acenaphthene is one of a group of chemicals called polycyclic aromatic hydrocarbons, PAHs for short. PAHs are often found together in groups of two or more. They can exist in over 100 different combinations but the most common are treated as a group of 15. PAHs are found naturally in the environment but they can also be man-made. Acenaphthene looks like a white crystal-like solid. PAHs are created when products like coal, oil, gas, and garbage are burned but the burning process is not complete.

Very little information is available on the individual chemicals within the PAH group. Most of the information available is for the PAH group as a whole. Information specific to acenaphthene is included in this fact sheet when available.

What is acenaphthene used for?

Most of the PAHs are used to conduct research. Like most PAHs, acenaphthene is used to make dyes, plastics and pesticides. Acenaphthene has been found in cigarette smoke, in the exhaust from automobiles and in wood preservatives.

How can acenaphthene enter and leave your body?

One of the most common ways acenaphthene can enter your body is through breathing contaminated air. It can get into your lungs when you breathe it. If you live near or work in a hazardous waste site where PAHs are disposed, you are likely to breathe acenaphthene and other PAHs. If you eat or drink food and water that are contaminated

with PAHs, you could be exposed.

Exposure can also occur if your skin comes into contact with contaminated soil or products like heavy oils, coal tar, roofing tar or creosote where PAHs have been found. Creosote is an oily liquid found in coal tar and is used to preserve wood. Once in your body, the PAHs can spread and target fat tissues. Target organs include kidneys, liver and fat. However, in just a matter of days, the PAHs will leave your body through urine and feces.

How can you be exposed to acenaphthene?

You can be exposed to most PAHs in the environment, in your home and in the workplace. Because PAHs exist naturally in the environment, and they are man-made, you can be exposed in a number of ways. Acenaphthene has been detected in fumes from vehicle exhaust, coal, coal tar, and at hazardous waste sites. These are all sources of exposure.

Since acenaphthene has been found in cigarettes, you can be exposed by breathing cigarette and tobacco smoke. Exposure to other PAHs can occur by eating foods grown in contaminated soil or by eating meat or other food that you grilled. Grilling and charring food actually increases the amount of PAHs in the food.

If you work in a plant that makes coal-tar or that uses petroleum or coal, or makes or uses wood preservatives, you could be exposed to acenaphthene and other PAHs.

What are the health effects of exposure to acenaphthene?

A number of PAHs have caused tumors in laboratory animals that were exposed to PAHs through their food, from breathing contaminated air and when it was applied to their skin. When pregnant mice ate high doses of a PAH (benzo(a)pyrene) they experienced reproductive problems. In addition, the offspring of the pregnant mice showed birth defects and a decrease in their body weight. Other effects include damage to skin, body fluids and the immune system which helps the body fight disease. However, these effects have not been seen in humans.

What levels of exposure have resulted in harmful health effects?

Acenaphthene can bother your skin and mucous membranes. Animal studies showed that rats fed 2 grams of acenaphthene for 32 days (long-term) had changes in their blood and some damage to the liver, kidney and lungs.

There is no information available from studies on humans to tell what effects can result from being exposed to individual PAHs at certain levels. However, breathing PAHs and skin contact seem to be associated with cancer in humans. Animal studies showed that mice exposed to 308 parts per million (ppm) of PAHs (specifically benzo(a)pyrene) in food for 10 days (short-term exposure) had offspring with birth defects. Mice exposed to 923 ppm of benzo(a)pyrene in food for a period of months developed problems in the liver and blood.

Where can you get more information?

Contact your state health or environmental department, or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road, N.E., E-29
Atlanta, Georgia 30333

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). *Public Health Statement, Polycyclic Aromatic Hydrocarbons*. Atlanta, GA: U.S. Department of Health and Human Services, 1990.
2. Faust, Rosmarie A., Oak Ridge National Laboratory, Chemical Hazard Evaluation Group. *Toxicity Summary for Acenaphthene*. Oak Ridge, TN:1994.
3. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Library of Medicine Bethesda, MD, 2001.