



## Bureau of Environmental Health and Radiation Protection

"Protect and improve the health of all Ohioans by preventing disease, promoting good health and assuring access to quality care."

# Benzene

(ben' zeen)

## Answers to Frequently Asked Health Questions

### What is benzene?

Benzene, also known as benzol, is a colorless liquid with a sweet odor. It is highly flammable and evaporates in the air quickly.

### Where do you find benzene?

Almost everyone is exposed to low levels of benzene in their everyday activities. People are exposed to small amounts of benzene in the air outside, at work and in the home.

Benzene is a natural part of crude oil, gas and cigarette smoke. Auto exhaust and industrial emissions account for about 20% of the total nationwide exposure to benzene. About 50% of the entire nationwide exposure to benzene results from smoking tobacco or from 2<sup>nd</sup> hand exposure to tobacco smoke. Other natural sources of benzene include volcanoes and forest fires.

The outdoor air has low levels of benzene that come from the car exhaust, gas fumes and cigarette smoke. Indoor air usually contains higher levels of benzene that can be found in cigarette smoke, glues, paints, furniture wax and detergents.

Benzene is widely used in U.S. industry. Some industries use benzene to make other chemicals which are used to make plastics, resins, nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs and pesticides.

### How do you come into contact with unhealthy levels of benzene?

#### In the air:

- Higher levels of benzene can be released in the air around industries that make or use benzene.

### In the underground drinking water:

- If underground storage tanks containing benzene leak, benzene could get into the underground well water and pollute it.

### Occupation (job):

- Working in an industry that makes or uses benzene.

### Can benzene make you sick?

Yes, you can get sick from benzene. Getting sick will depend on:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle  
Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

### How does benzene affect health?

#### Breathing benzene:

Breathing high levels of benzene can cause rapid heart rate, dizziness, headaches, tremors (shaking), confusion, drowsiness (sleepy), and unconsciousness (passing out). Breathing extremely high levels of benzene can result in death.

#### Eating or drinking benzene:

Eating foods or drinking water containing high levels of benzene can cause an irritated (upset) stomach, vomiting, rapid heart rate, dizziness, convulsions (severe shaking), sleepiness and death.

### **Long-term exposure to benzene:**

Long-term exposure (365 days or longer) to high levels of benzene causes serious problems with the production of blood. Benzene harms the bone marrow which produces the body's red and white blood cells. Red blood cells carry oxygen and white blood cells fight infection. A decrease in red blood cells leads to anemia. A decrease in white blood cells affects the immune system and increases the chance for infection.

### **Women exposed to benzene:**

Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. It is not known whether benzene exposure affects the developing fetus in pregnant women or fertility in men.

### **Does benzene cause cancer?**

Yes, the Department of Health and Human Services (HHS) has determined that benzene is a known human carcinogen (causes cancer).

Long-term exposure to high levels of benzene in the air can lead to leukemia and cancers of the blood-forming organs.

### **Is there a medical test to show whether you have been exposed to benzene?**

Several tests can show if you have been exposed to benzene. However, all these tests must be done shortly after exposure because benzene leaves the body quickly. These tests include testing the breath, blood and urine. However, the urine test may not be as effective to measure benzene levels.

Note that all these tests will show the amount of benzene in your body but cannot tell you whether you will have any harmful health problems. They also do not tell you where the benzene came from.

### **What has been done to protect human health?**

The Occupational Safety and Health Administration (OSHA) has set a permissible

1 ppm exposure limit of air in the workplace during an 8-hour workday, 40-hour week.

The Environmental Protection Agency (EPA) has set the maximum permissible level of benzene in drinking water at 0.005 parts per million (ppm).

The EPA requires benzene spills or accidental releases into the environment of 10 pounds or more of be reported to the EPA.

Most people can begin to smell benzene in air at 1.5 - 4.7 parts of benzene parts per million (ppm) and smell benzene in water at 2 ppm. Most people can begin to taste benzene in water at 0.5 – 4.5 ppm.

### **References:**

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for benzene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2006.

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2006.

### **Where Can I Get More Information?**

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