

This fact sheet answers the most frequently asked health questions (FAQs) about 2,3-benzofuran. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**SUMMARY:** Exposure to 2,3-benzofuran is most likely to occur from breathing contaminated air at the workplace. Animal studies have shown effects on the liver, kidneys, lungs, and stomach from exposure to high levels of 2,3-benzofuran. This chemical has been found in at least 11 of 1,416 National Priorities List sites identified by the Environmental Protection Agency.

### What is 2,3-benzofuran?

(Pronounced 2,3-bĕn-zō'fyŏŕ'ŏn')

2,3-Benzofuran is a colorless, sweet-smelling, oily liquid made by processing coal into coal oil. It may also be formed during other uses of coal or oil.

2,3-Benzofuran is not used for any commercial purposes, but the part of the coal oil that contains 2,3-benzofuran is made into a plastic called coumarone-indene resin. This resin resists corrosion and is used to make paints and varnishes. The resin also provides water resistance and is used in coatings on paper products and fabrics. It is used as an adhesive in food containers and some asphalt floor tiles.

The resin has been approved for use in food packages and as a coating on citrus fruits. We do not know how often the resin is used or whether any 2,3-benzofuran in the coating or packaging gets into the food.

### What happens to 2,3-benzofuran when it enters the environment?

- ☐ Very little is known about the stability or breakdown of 2,3-benzofuran or of the coumarone-indene resin.
- ☐ 2,3-Benzofuran may enter the air, water, and soil during its manufacture, use, or storage at hazardous waste sites.

waste sites.

- ☐ It does not readily dissolve in water, but may enter the groundwater near manufacturing or hazardous waste sites.
- ☐ Limited information indicates that it will move into soil and sediment from water, but more information is needed.
- ☐ 2,3-Benzofuran is not expected to accumulate in fish or aquatic animals to any great extent.
- ☐ One study reported detecting 2,3-benzofuran in human breast milk, indicating that the mother had been exposed.

### How might I be exposed to 2,3-benzofuran?

- ☐ Breathing contaminated air or touching the chemical in the workplace.
- ☐ Breathing contaminated air around manufacturing or hazardous waste sites.
- ☐ Eating foods from packaging material that contain coumarone-indene resins, but not much is known about how much gets into the food.
- ☐ Smoking cigarettes.
- ☐ Drinking contaminated water near manufacturing or hazardous waste sites.
- ☐ Drinking contaminated human breast milk.

ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>

### **How can 2,3-benzofuran affect my health?**

Very little is known about the possible harmful effects of 2,3-benzofuran to human health. There are no studies that have looked at the effects in people from exposures to air, water, or food, or through skin contact. There are some studies in animals from exposures in food or water.

Rats and mice that ingested high levels of 2,3-benzofuran over a short time had liver and kidney damage. Those exposed over a long time to moderate levels had liver, kidney, lung, and stomach damage. In one study, the ability of animals to reproduce was not affected. We do not know if people will experience health effects similar to those seen in animals.

### **How likely is 2,3-benzofuran to cause cancer?**

The Department of Health and Human Services has not classified 2,3-benzofuran as to its human carcinogenicity.

The International Agency for Research on Cancer and the Environmental Protection Agency (EPA) have also not classified 2,3-benzofuran as to its human carcinogenicity.

Cancer of the kidneys, lungs, liver, or stomach was seen in rats and mice that ingested 2,3-benzofuran for long periods of time.

There are no studies on 2,3-benzofuran's potential to cause cancer in people.

### **Is there a medical test to show whether I've been exposed to 2,3-benzofuran?**

There is a test to measure 2,3-benzofuran in the blood or in breast milk. However, this test requires special equipment and is not usually available in your doctor's office.

This test may only measure 2,3-benzofuran from a recent exposure. It is not known how long 2,3-benzofuran remains in your body after you have been exposed. The test can't tell whether you may develop any health problems from an exposure.

### **Has the federal government made recommendations to protect human health?**

There are no standards or recommendations specific for 2,3-benzofuran.

The Food and Drug Administration (FDA) allows 200 parts of coumarone-indene resin per million parts of coating on the peels of citrus fruits (200 ppm).

FDA also allows the use of coumarone-resin as a component of adhesives used in food packaging and as a substance in plastics intended for repeated use in contact with food.

### **Glossary**

Carcinogenicity: Ability to cause cancer.

Ingesting: Taking food or drink into your body.

ppm: Parts per million.

Short time: Lasting 14 days or less.

Long time: Lasting one year or longer.

### **References**

Agency for Toxic Substances and Disease Registry (ATSDR). 1992. Toxicological profile for 2,3-benzofuran. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

### **Where can I get more information?**

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

