



BERYLLIUM

CAS # 7440-41-7

Agency for Toxic Substances and Disease Registry ToxFAQs

April 1993

This fact sheet answers the most frequently asked health questions (FAQs) about beryllium. For more information, you may call 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 beryllium happens mostly in the workplace, near some hazardous waste sites, and from breathing tobacco smoke. Lung damage has been observed in some people who have breathed contaminated air. Some people become highly sensitive to beryllium exposure. Beryllium has been found in at least 349 of 1,300 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is beryllium?

(Pronounced bə-ryl'ē-əm)

Pure beryllium is a hard, grayish metal. In nature, beryllium can be found in compounds in mineral rocks, coal, soil, and volcanic dust. Beryllium compounds are commercially mined, and the beryllium purified for use in electrical parts, machine parts, ceramics, aircraft parts, nuclear weapons, and mirrors. Beryllium compounds have no particular smell.

What happens to beryllium when it enters the environment?

- Beryllium dust gets into air from burning coal and oil.
- Beryllium dusts settle from air to the soil and water.
- It enters water from rocks and soil, and from industrial waste.
- Some beryllium compounds dissolve in water, but most settle to the bottom as particles.
- Beryllium particles in ocean water may take a few hundred years to settle to the bottom.
- Most beryllium in soil doesn't move up to the surface or into the groundwater.
- Fish do not build up beryllium in their bodies from the surrounding water to any great extent.

How might I be exposed to beryllium?

- Background levels in air, food, and water are low.
- Breathing contaminated workplace air (e.g., mining or processing ores, alloy and chemical manufacturing with beryllium, machining or recycling metals containing beryllium).
- Breathing tobacco smoke from leaf high in beryllium.
- Breathing contaminated air or ingesting water or food near industry or hazardous waste sites.

How can beryllium affect my health?

Beryllium can be harmful if you breathe it. The effects depend on how much you are exposed to and for how long. High levels of beryllium in air cause lung damage and a disease that resembles pneumonia. If you stop breathing beryllium dust, the lung damage may heal.

Some people become sensitive to beryllium. This is called a hypersensitivity or allergy. These individuals develop an inflammatory reaction to low levels of beryllium. This condition is called chronic beryllium disease, and can occur long after exposure to small amounts of beryllium. This disease can make you feel weak and tired, and can cause difficulty in breathing. Both the short-term, pneumo-



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nia-like disease and the chronic beryllium disease can cause death.

Swallowing beryllium has not been reported to cause effects in humans because very little beryllium can move from the stomach and intestines into the bloodstream. Beryllium contact with scraped or cut skin can cause rashes or ulcers.

How likely is beryllium to cause cancer?

The Department of Health and Human Services (DHHS) has determined that beryllium and certain beryllium compounds may reasonably be anticipated to be carcinogens. This determination is based on animal studies and studies in workers. None of the studies provide conclusive evidence, but when taken as a whole, they indicate that long-term exposure to beryllium in the air results in an increase in lung cancer.

Is there a medical test to show whether I've been exposed to beryllium?

Tests can measure beryllium in the urine and blood. The amount of beryllium in blood or urine may not indicate how much or how recently you were exposed. Small amounts of human lung and skin can also be removed from the body and examined for beryllium. These tests can be done in a doctor's office or in a hospital.

One test uses blood cells washed out of the lung. If these cells start growing in the presence of beryllium, you are probably sensitive to beryllium and may have chronic beryllium disease.

Has the federal government made recommendations to protect human health?

The EPA restricts the amount of beryllium that industries may emit into the environment to 10 grams (g) in a 24-hour period, or to an amount that would result in atmospheric levels of 0.01 micrograms (μg) beryllium per cubic meter (m^3) of air, averaged over a 30-day period.

The National Institute for Occupational Safety and Health (NIOSH) recommends a standard for occupational exposure of 0.5 μg beryllium/ m^3 of workroom air during an 8-hour shift to protect workers from potential cancer.

The Occupational Safety and Health Administration (OSHA) sets a limit of 2 μg beryllium/ m^3 of workroom air for an 8-hour work shift.

Glossary

Carcinogen: A substance with the ability to cause cancer.

Ingesting: Taking food or drink into your body.

Hypersensitivity: A greater than normal bodily response to a foreign agent.

Microgram (μg): One millionth of a gram.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for beryllium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Case studies in environmental medicine: Beryllium toxicity. 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 E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-639-6359. 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.

