

Barium

What is barium? (Pronounced bar'e-um)

Barium is a silvery-white metal found in nature. It occurs combined with other chemicals such as sulfur or carbon and oxygen. These combinations are called compounds. Barium compounds can also be produced by industry. Barium compounds are used by the oil and gas industries to make drilling muds. Drilling muds make it easier to drill through rock by keeping the drill bit lubricated. They are also used to make paint, bricks, tiles, glass, and rubber. A barium compound (barium sulfate) is sometimes used by doctors to perform medical tests and to take x-rays of the stomach.

What happens to barium when it enters the environment?

- Barium gets into the air during the mining, refining, and production
- of barium compounds, and from the burning of coal and oil.
- Some barium compounds dissolve easily in water and are found in lakes, rivers, and streams.
- Barium is found in most soils and foods at low levels.
- Fish and aquatic organisms accumulate barium.

How might I be exposed to barium?

- Breathing very low levels in air, drinking water, and eating food
- Breathing higher levels in air while working in industries that make or use barium compounds
- Drinking water containing high levels of barium from natural sources
- Breathing air near barium mining or processing plants.

How can barium affect my health?

The health effects of the different barium compounds depend on how well the compound dissolves in water. Barium compounds that do not dissolve well in water are not generally harmful and are often used by doctors for medical purposes.

Those barium compounds that dissolve well in water may cause harmful health effects in people.

Ingesting high levels of barium compounds that dissolve well in water over the short term has resulted in

- Difficulties in breathing
- Increased blood pressure
- Changes in heart rhythm
- Stomach irritation
- Brain swelling
- Muscle weakness
- Damage to the liver, kidney, heart, and spleen.

We don't know the effects in people of ingesting low levels of barium over the long term. Animal studies have found increased blood pressure and changes in the heart from ingesting barium over a long time. We don't know the effects of barium from breathing it or from touching it.

How likely is barium to cause cancer?

The Department of Health and Human Services, the International Agency for Research on Cancer, and the Environmental Protection Agency (EPA) have not classified barium as to its human carcinogenicity. Barium has not been classified because there are no studies in people and the two available animal studies were inadequate to determine whether or not barium causes cancer.

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

There is no routine medical test to show whether you have been exposed to barium. However, doctors can measure barium in the blood, bones, urine, and feces, using very complex instruments. Due to the complexity of the tests, these tests are usually done only for cases of severe barium poisoning and for medical research.

Has the federal government made recommendations to protect human health?

EPA allows 2 parts of barium per million parts of drinking water (2 ppm). EPA requires that discharges or spills into the environment of 10 pounds or more of barium cyanide be reported.

The Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the American Conference of Governmental Industrial Hygienists (ACGIH) have set an occupational exposure limit of 0.5 milligrams of soluble barium compounds per cubic meter of air (0.5 mg/m³) for an 8-hour workday, 40-hour workweek.

The OSHA exposure limit for barium sulfate dust in air is 5 to 15 milligrams of barium per cubic meter of air (5-15 mg/m³).

NIOSH currently recommends that a level of 50 mg/m³ be considered immediately dangerous to life and health. This is the exposure level of barium that is likely to cause permanent health problems or death.

Glossary

Carcinogenicity: Ability to cause cancer.

Ingesting: Taking food or drink into your body.

Long-term: Lasting one year or longer.

Milligram (mg): One thousandth of a gram.

PPM: Parts per million.

Short-term: Lasting 14 days or less.

Soluble: Dissolves well in liquid.

References

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

Where can I get more information?

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.

For more information, contact:

Agency for Toxic Substances and Disease Registry
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Atlanta, GA 30333
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