

## SILVER

### What is silver?

Silver is a metallic element found in nature. It often combines with other elements, including oxygen, sulfur, chlorine, and nitrogen. Pure silver has a lustrous medium gray color. Yet silver nitrate and silver chloride are white, and silver sulfide and silver oxide are dark gray to black.

### Where can silver be found and how is it used?

Silver is rare but is only found in nature, often by mining. Silver is a soft metal often used for making jewelry. It is also used for silverware, electronic equipment, and dental fillings. Silver compounds can be found at hazardous waste sites mixed with soil and/or water. Silver compounds are used for the coating of photographic and x-ray film. Photography materials are the major source of discarded silver.

When rocks and soil with silver in them are worn down by wind and rain, silver can be carried long distances in the air and water. Silver stays in the environment until people remove it. Silver does not break down and can change form by combining with other elements.

### How can people be exposed to silver?

You could be exposed to silver through:

- **Breathing** silver particles or dust at work or at home.
- **Drinking** water with silver compounds in it. This can happen if you live in an area where silver compounds dissolved in the drinking water.
- **Touching** silver when handling it at work or at home.
- **Eye Contact** by getting silver dust in the eyes. This can happen if you handle silver at work or at home. Other sources of exposure include the use of silver in medicines, and in activities such as jewelry-making, soldering, and photography. Wearing jewelry or eating with silver-coated flatware is not harmful.

### How does silver work and how can it affect my health?

Silver enters the body through the mouth, throat, or stomach when you eat food or drink water containing silver. If you live near a hazardous waste site, the most likely way that silver might enter your body is when you drink groundwater near the site, or when you eat food grown in soil containing silver.

**Poison Control Center 24/7 Emergency Contact Number: 1-800-222-1222**  
**DPH 24/7 Contact Number: 1-888-295-5156**



## Frequently Asked Questions

Silver enters your lungs if you breathe air with silver in it. Silver can enter your body through your skin, such as photographers touching powders with silver in them. Some medicines containing silver are taken or put on the skin or gums. Much less silver will enter the body through the skin than through the lungs or stomach.

Many silver compounds dissolve in water. They do not turn into a vapor. If silver is eaten or inhaled, it leaves the body in waste matter in about a week. Some of the silver that is eaten, inhaled, or passes through the skin may build up in many places in the body.

Repeated exposures to silver compounds can cause skin and other body tissues to turn gray or blue-gray. This condition is called argyria, which is harmless but is permanent cosmetically. It usually happens in people who eat or breathe in silver compounds for several months or many years. A single exposure to a silver compound may cause silver to be deposited on the skin and in other parts of the body, but this is harmless.

Exposure to dust with high levels of silver compounds such as silver nitrate or silver oxide may cause breathing problems, lung and throat irritation, and stomach pain. Effects like these have been seen in factory workers that make silver nitrate and silver oxide. One man had severe breathing problems shortly after working with melted silver. Skin contact with silver compounds cause mild allergic reactions, including a rash, pain, redness, and swelling.

In one animal study, long-term exposure to silver nitrite in drinking water led animals to be less active than unexposed animals. Another study found that animals that drank water with slightly higher levels of silver for nine months or longer had enlarged hearts. It is not known if these effects would happen in humans. Some studies suggest that silver can cause kidney problems in people.

Cancer or birth defects were not found in animals exposed to silver compounds through eating, drinking, or breathing. It is not known if these effects occur in humans. Animal tests show that for humans, silver would be life-threatening only if large amounts were swallowed. Skin contact is not likely to be life-threatening.

### **How is silver poisoning treated?**

If a person has eaten silver nitrate, treatment should begin right away. Usually, the stomach is washed out with repeated injections of a special solution. Then, a solution will be given to cause a bowel movement. Other substances will be given to calm internal membranes. Pain medicine may also be given.

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### What should I do if exposed to silver?

- **If you get silver in your eyes**, rinse with plenty of water for several minutes. Remove your contact lenses if you can do so easily. Go to a doctor.
- **If you touch silver**, rinse the skin with plenty of soap and water or take a shower.
- **If you breathe silver dust**, get fresh air and rest.

### What factors limit use or exposure to silver?

If you work with silver on the job or at home, be near fresh air and wear protective clothes.

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

Silver can be measured in the blood, urine, waste matter, and body tissues. Urine and blood are used most often to test for recent exposure to silver. The best way to learn if past exposure has occurred is to look for silver in skin samples. These tests cannot tell if health effects will occur from silver exposure.

### Technical information for silver

CAS Number: 744022-4

Chemical Formula: Ag

Carcinogenicity (EPA): D – Not classifiable as to human carcinogenicity.

MCL (Drinking Water): 0.10 milligrams per liter of water

OSHA Standards: 0.01 milligrams per cubic meter of air

NIOSH: 0.01 milligrams per cubic meter of air

ACGIH: 0.1 mg/m<sup>3</sup>, 8 hr. Time Weighted Avg. (TWA)

### Resources

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. *Toxicological profile for silver*. Atlanta, GA: U.S. Department of Health and Human Services.  
<https://www.cdc.gov/TSP/ToxProfiles/ToxProfiles.aspx?id=539&tid=97>

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