

# Environmental Health Fact Sheet

## Bromides

### What are bromides?

- Bromides are chemical compounds that contain the element bromine.
- Bromine is a nonmetallic element that is a liquid at room temperature. It has a brownish-red color, a bleach-like odor, and it dissolves in water.
- Bromides commonly exist in the form of salts with sodium, potassium, and other positively charged atoms.

### Are there commercial uses for these compounds?

- Some bromine containing compounds were historically used as over-the-counter sedatives. However, these over-the-counter drugs are for the most part no longer available in the United States (U.S.).
- Some medicines in the U.S. requiring prescriptions contain bromides.
- Bromides are used outside of the United States to treat certain types of epilepsy.

### Are bromides present in the environment?

- The earth's crust contains an average of 1.6 parts per million (ppm) of bromine.
- Bromine is widely distributed in nature. The average bromine content in soils is 5 parts per million (ppm). Land plants contain about 15 ppm of the substance.
- Bromine/bromides also occurs in the oceans, in water of closed basins (salt lakes), and in brines or salt deposits.
- Bromine is commonly found in groundwater. Almost all bromine from natural sources found in groundwater is in the form of bromide.
- Concentrations of bromine in fresh water typically range from trace amounts to about 0.5 milligrams per liter (mg/L) or 0.5 ppm.

### How are people exposed to bromides?

- Bromides are naturally present in some foods. The typical daily dietary intake of bromide in the United States is 2 – 8 milligrams (mg) from grains, nuts, and fish.
- People may also be exposed to bromides by drinking private well water.

- Bromide compounds can be formed during reactions between chlorine and naturally occurring organic matter in drinking water, forming brominated and mixed chloro-bromo byproducts, such as trihalomethanes or halogenated acetic acids, or it can react with ozone to form bromate.

### **What happens to bromides once it enters the body?**

- Bromides are absorbed in the gut, travel to body tissues through the blood, and excreted mainly in the urine.
- Bromides are also excreted in breast milk.
- Bromides can cross the placental barrier and accumulate in the fetus.
- Bromides can penetrate the blood-brain barrier and affect the brain.
- In humans, it takes about 12 days for half of the bromide in the blood to be eliminated from the body.

### **How harmful is exposure to bromides?**

- Signs of acute toxicity include nausea, vomiting, and diarrhea. However, these signs are not necessarily mean exposure to bromides has occurred.
- Serum bromide levels at which toxic symptoms appear are extremely variable.
- Symptoms are commonly seen at serum concentrations of bromide between 50 and 100 mg/dL.
- Serum bromide concentrations of 100 to 200 mg/dL can produce bromism. Bromism manifests as a collection of psychiatric, neurological, and dermatological symptoms.
- Bromides may affect thyroid function in women.

### **Can exposure to bromides cause cancer?**

- Bromides are not carcinogenic, however, some bromine containing compounds can cause cancer.

### **Is there a medical test to show whether I've been exposed to bromide containing compounds?**

- There are tests that measure the amount of bromide in blood or urine, but these tests are only useful if done within 1-2 days following exposure and cannot predict if any health effects will occur.
- These tests are not routinely performed at doctors' offices, but your doctor can take blood or urine samples and send them to a testing laboratory.

### **What is the treatment for bromide poisoning?**

- Emergency medical care should be sought in cases of suspected poisoning with bromine or bromine containing compounds.
- Bromide poisoning is treated with supportive medical care in a hospital setting.
- The most important element of treatment is stopping exposure to bromide.

### **Are there recommendations to protect public health?**

- WHO has set an acceptable daily intake (ADI) for inorganic bromides in humans of 0.4 mg/kilogram (mg/kg) of body-weight.

### **What can I do to prevent exposure to bromides?**

- Food and water are the greatest potential sources of human exposure to bromine containing compounds.
- People can limit exposure to foods and water known to contain these compounds. However, normally, the amount of bromides in foods and water are usually too low to cause health concerns.
- Distillation or reverse osmosis and activated charcoal filtration will remove bromine-containing compounds from drinking water.

### **What should I do if I believe I am ill as a result of exposure to bromides?**

- If you experience symptoms that you think may be related to bromide exposure, you should see your physician.

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

For more information, contact:

The Pennsylvania Department of Health, Division of Environmental Health Epidemiology, P.O. Box 90, Harrisburg, Pennsylvania, 17108. Telephone number: 717-787-1708 or visit the following websites:

Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry: <http://www.atsdr.cdc.gov>

U.S. Environmental Protection Agency: <http://www.epa.gov>

### **References**

- (1) National Academies Press, Mineral Tolerance of Domestic Animals (1980).
- (2) Centers for Disease Control and Prevention. Facts about Bromine, searched 6/9/11 at <http://www.bt.cdc.gov/agent/bromine/basics/facts.asp>.

- (3) Bromide in drinking-water, Background document for development of WHO *Guidelines for Drinking-water Quality*, World Health Organization (2009).
- (4) Unit Code: 8608: Bromide, Blood, Clinical Information, MayoMedicalLaboratories.com searched June 13, 2001.
- (5) A Review of the Scientific Literature As It Pertains to Gulf War Illnesses, Volume 2, Pyridostigmine Bromide, Beatrice Alexandra Golomb, National Defense Research Institute, 1999 Rand.
- (6) Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Statement for Bromomethane, September 1992.