Sources of Exposure

General Populations

- Exposure to the general population may be minimal since 1-bromopropane is primarily used in industrial applications.
- General population exposure can occur, however, via inhalation of ambient air in the vicinity of industrial facilities where 1-bromopropane is used in aerosol applications.
- 1-Bromopropane has not been detected in drinking water or food.

Occupational Populations

- Workers using 1-bromopropane as a spray adhesive have the highest exposures.
- Workers involved in the production of 1-bromopropane, as well as those using it in commercial applications, such as adhesive sprays, degreasing operations for cleaning metals, plastics, and electronic components, dry cleaning, asphalt production, aircraft maintenance, and synthetic fiber manufacturing, also have potential for high exposure.

Toxicokinetics and Normal Human Levels

Toxicokinetics

- Studies in workers indicate that 1-bromopropane can be absorbed through the lungs and the skin.
- Studies in animals indicate that it can also be absorbed through the gastrointestinal tract.
- 1-Bromopropane distributes widely to tissues. Some accumulation may occur with repeated exposures.
- Metabolism of 1-bromopropane involves both microsomal enzymes and conjugation reactions.
- Limited data indicate that in humans, at least part of the absorbed 1-bromopropane is eliminated as metabolites in the urine.
- In animals, 1-bromopropane is eliminated by exhalation of the parent compound and carbon dioxide derived from breakdown products and by urinary excretion of metabolites.

Normal Human Levels

- No data were located regarding levels of 1-bromopropane in blood or tissues from members of the U.S. general population.

Biomarkers/Environmental Levels

Biomarkers

- 1-Bromopropane and the metabolite N-acetyl-S-propylcysteine in urine can be used as biomarkers of exposure to 1-bromopropane.

Environmental Levels

Air

- In 2014, 1-bromopropane was detected in ambient air in Philadelphia, PA, at levels of 0.14–0.16 ppb. No additional data are available.

Sediment and Soil

- No data are available for levels of 1-bromopropane in sediment and soil.

Water

- No data are available for levels of 1-bromopropane in water.

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2016. Toxicological Profile for 1-Bromopropane (Draft for public comment). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

C_3H_7Br

ToxGuide™ for 1-Bromopropane

C_3H_7Br

CAS# 106-94-5

January 2016

U.S. Department of Health and Human Services
Public Health Service
Agency for Toxic Substances and Disease Registry
www.atsdr.cdc.gov

Contact Information:
Division of Toxicology
and Human Health Sciences
Environmental Toxicology Branch

1600 Clifton Road NE, F-57
Atlanta, GA 30329-4027
1-800-CDC-INFO
1-800-232-4636

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Chemical and Physical Information

1-Bromopropane is a liquid

- 1-Bromopropane is a colorless liquid. 1-Bromopropane is a synthetic chemical, it does not occur naturally in the environment.
- 1-Bromopropare was originally used as an intermediate in the production of pesticides, flavors and fragrances, pharmaceuticals, and other chemicals.
- It is currently used as a solvent in the adhesives, dry cleaning, vapor degreasing, and electronic and metal cleaning industries.

Routes of Exposure

- Inhalation – Principal route of exposure for workers using 1-bromopropane in aerosol applications. Potential route of exposure for populations living near industrial facilities where 1-bromo-propane is used in aerosol applications.
- Oral – Not an important route of exposure because 1-bromopropane has not been detected in food or water.
- Dermal – Important route of exposure for workers using 1-bromopropane as a spray adhesive.

1-Bromopropane in the Environment

- 1-Bromopropane quickly evaporates into the air when released to the environment.
- In air, it is broken down quickly; half of 1-bromopropane will be broken down in two 2 weeks.
- 1-Bromopropane that enters surface water is slowly broken down. Most of it evaporates into air.
- 1-Bromppropane released to soil can enter surface water. It is not bound to soil particles, so it may enter groundwater.
- 1-Bromopropane is not likely to concentrate in the food chain.

Relevance to Public Health (Health Effects)

Health effects are determined by the dose (how much), the duration (how long), and the route of exposure.

Minimal Risk Levels (MRLs)

Inhalation

- An MRL of 1 ppm has been derived for acute-duration inhalation exposure (≤14 days).
- An MRL of 0.1 ppm has been derived for intermediate–duration inhalation exposure (15–364 days).
- An MRL of 0.02 ppm has been derived for chronic-duration inhalation exposure (365 days or longer).

Oral

- An MRL of 0.2 mg/kg/day has been derived for acute-duration oral exposure (≤14 days).
- No MRL was derived for intermediate-duration oral exposure (15–364 days).
- No MRL was derived for chronic-duration oral exposure (365 days or longer).

Health Effects

- 1-Bromopropane can affect the nervous system. Low levels can cause headache, decreased sensation in the fingers and toes, and a drunk-like feeling.
- Long-term exposure to higher levels of 1-bromopropane has caused weakness, incoordination, loss of feeling, inability to walk, and damage to nerves. Damage to the nervous system may result in long-lasting effects.
- Inhalation exposure may also result in nose and throat irritation.
- 1-Bromopropane has caused tumors in animal studies. The Department of Health and Human Services has classified 1-bromopropane as "*reasonably anticipated to be a human carcinogen*". The International Agency for Research on Cancer and the EPA have not evaluated the carcinogenicity of 1-bromopropane.

Children's Health

- The health effects of 1-bromopropane exposure in children are not known. The nervous system is expected to be a target based on findings in adults.
- Studies in animals have shown effects when mothers were exposed to levels of 1-bromopropane during pregnancy and/or nursing much higher than is expected to occur in humans. There are no similar data in humans.