

## **BROMOFORM (CHBr<sub>3</sub>)**

Chemical Abstracts Service (CAS) Number: 75-25-2

### **General Information**

Bromoform is a colorless to pale yellow liquid with a sweetish odor. The acute (short-term) effects from inhalation or ingestion of high levels of bromoform in humans and animals consist of nervous system effects such as the slowing down of brain functions, and injury to the liver and kidney. Animal studies indicate that chronic (long-term) oral exposure to bromoform can have effects on the liver, kidney, and central nervous system. Human studies are considered inadequate in establishing a link between exposure to bromoform and an increased risk of cancer. Animal studies have demonstrated an increase in the incidences of liver and intestinal cancer following oral exposure to bromoform. U.S. EPA has classified bromoform as a Group B2, probable human carcinogen.

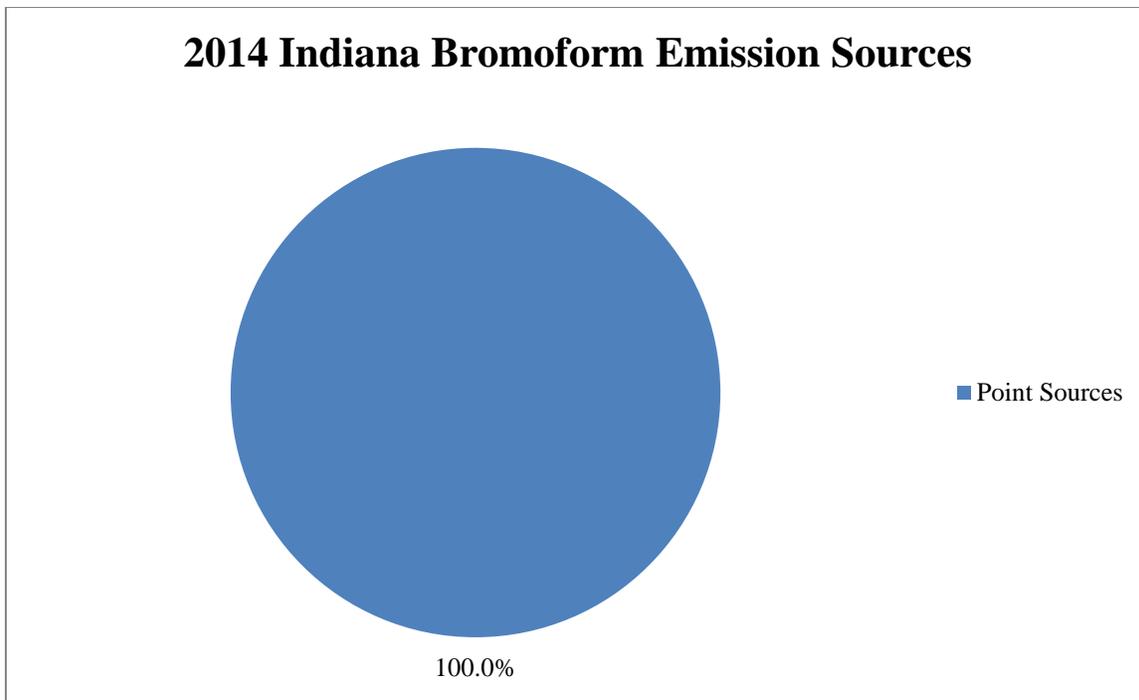
### **Sources**

- Bromoform is used as a fluid for mineral ore separation in geological tests, as a laboratory reagent, and in the electronics industry in quality assurance programs.
- Bromoform was formerly used as a solvent for waxes, greases, and oils, as an ingredient in fire-resistant chemicals and in fluid gauges. It has also been used as an intermediate in chemical synthesis, as a sedative, and as a cough suppression agent.
- The principal route of human exposure to bromoform is from the consumption of chlorinated drinking water.
- Exposure to low levels through inhalation or through the skin could occur in swimming pools that have been disinfected with bromine or bromine compounds.
- Exposure could also occur from inhalation of ambient air near factories or laboratories that use bromoform, or near a chemical waste site where bromoform leaked into water or soil.

### **Indiana Emissions**

IDEM collects HAP emissions information for the categories of point sources (large stationary sources like power plants and factories), nonpoint sources (aka area sources - smaller stationary sources like gas stations and dry cleaners), and mobile sources (vehicles, airplanes, marine vessels, etc.).\* Estimated statewide emissions of bromoform totaled 0.94 tons in the 2014 calendar year. All emissions were attributed to point sources.

## 2014 Indiana Bromoform Emission Sources



\* For additional examples of types of emission sources, please visit IDEM's Hazardous Air Pollutants page at: <http://www.in.gov/idem/toxic/pages/hap/index.html>. For specific details on industrial sources of air toxics, please visit U.S. EPA's Toxics Release Inventory (TRI) page at: <https://www.epa.gov/toxics-release-inventory-tri-program>.

### Measured Concentration Trends

Ambient air monitoring data most accurately represents a limited area near the monitor location. All monitors for air toxics sample every sixth day. The monitoring locations by themselves are not sufficient to accurately characterize air toxic concentrations throughout the entire state, however, results from the monitors will provide exposure concentrations with a great deal of confidence at the monitoring locations.

The ambient air monitoring results were analyzed using U.S. EPA recommended statistical methods. IDEM evaluated the data so that a 95% upper confidence limit of the mean (UCL) could be determined. A 95% UCL represents a value which one can be 95% confident that the true mean of the population is below that value.

To learn more about the current monitoring locations, please visit IDEM's Air Toxics Monitor Siting webpage at: <http://www.in.gov/idem/toxic/2337.htm>

Data analysis was performed for each monitor that operated for a significant portion of the analysis period. This analysis determined the detection rate, which is defined as the percentage of valid samples taken statewide that had a quantifiable concentration of the pollutant. The statewide detection rate for the monitors analyzed from 2006-2015 was 1.9%. This detection

rate is too low for IDEM to draw any conclusions about concentration trends of bromoform. IDEM did not perform a trend analysis for any pollutant with a detection rate less than 50%.