

## **BENZYL CHLORIDE (C<sub>7</sub>H<sub>7</sub>Cl)**

Chemical Abstracts Service (CAS) Number: 100-44-7

### **General Information**

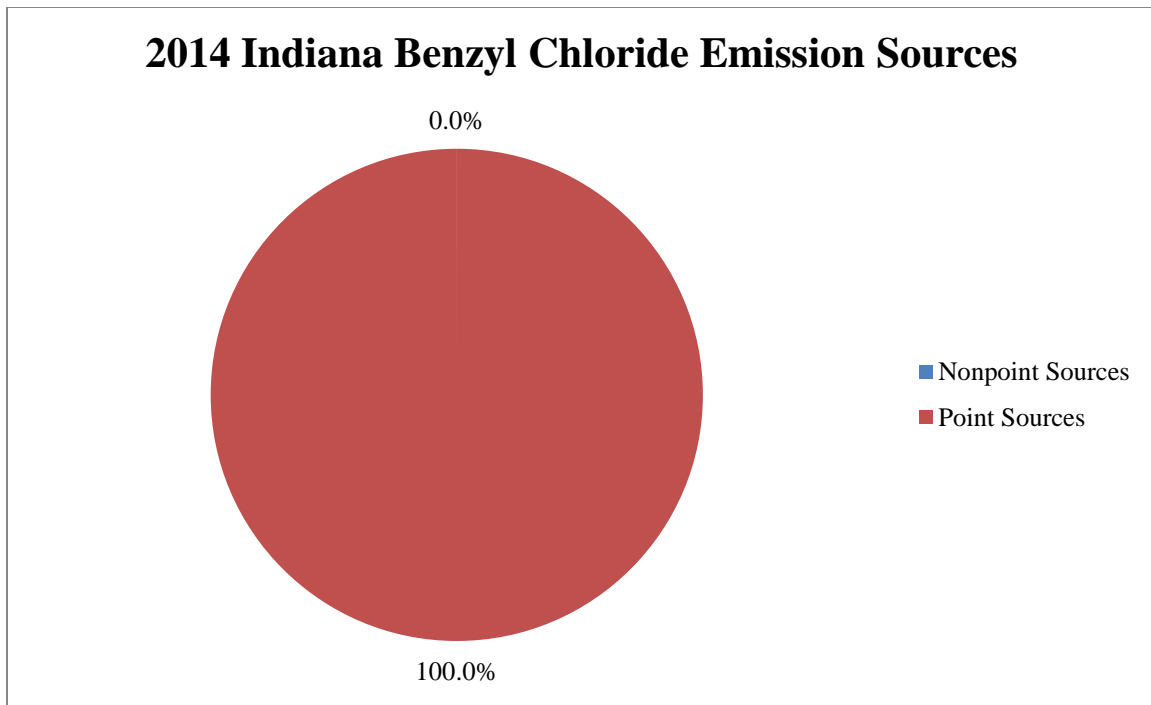
Benzyl chloride is a colorless liquid with a very pungent odor. Benzyl chloride is used as a chemical intermediate in the manufacture of certain dyes and pharmaceutical products and as a photographic developer. The acute (short-term) effects of benzyl chloride from inhalation exposure in humans consist of severe irritation of the upper respiratory tract, skin, eyes, and mucous membranes, and lung damage along with pulmonary edema (fluid in lungs). Exposure to high concentrations also causes effects on the central nervous system (CNS). Animal data indicate that long-term exposure to benzyl chloride by gavage (placing it experimentally in the stomachs of mice) increased the incidence of benign and malignant tumors at multiple sites and resulted in a significant increase in thyroid tumors in female rats. U.S. EPA has classified benzyl chloride as a Group B2, probable human carcinogen.

### **Sources**

- Benzyl chloride is used as a chemical intermediate in the manufacture of certain dyes and pharmaceutical, perfume and flavor products. It is also used as a photographic developer.
- Benzyl chloride can be used in the manufacture of synthetic tannins and as a gum inhibitor in petrol.
- Benzyl chloride has been used as an irritant gas in chemical warfare.
- Benzyl chloride has also been detected in emissions from the burning of polyvinyl chloride, neoprene and rigid urethane foam compounds.
- Individuals may be exposed to benzyl chloride through breathing contaminated air or from exposure to water or soil that has been contaminated with benzyl chloride.

### **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 benzyl chloride totaled 17.03 tons in the 2014 calendar year. Of this total, nearly 100% was attributed to point sources, with a small fraction attributed to nonpoint sources. No emissions were attributed to mobile 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 2.2%. This detection

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