

STYRENE (C₈H₈)

Chemical Abstracts Service (CAS) Number: 100-42-5

General Information

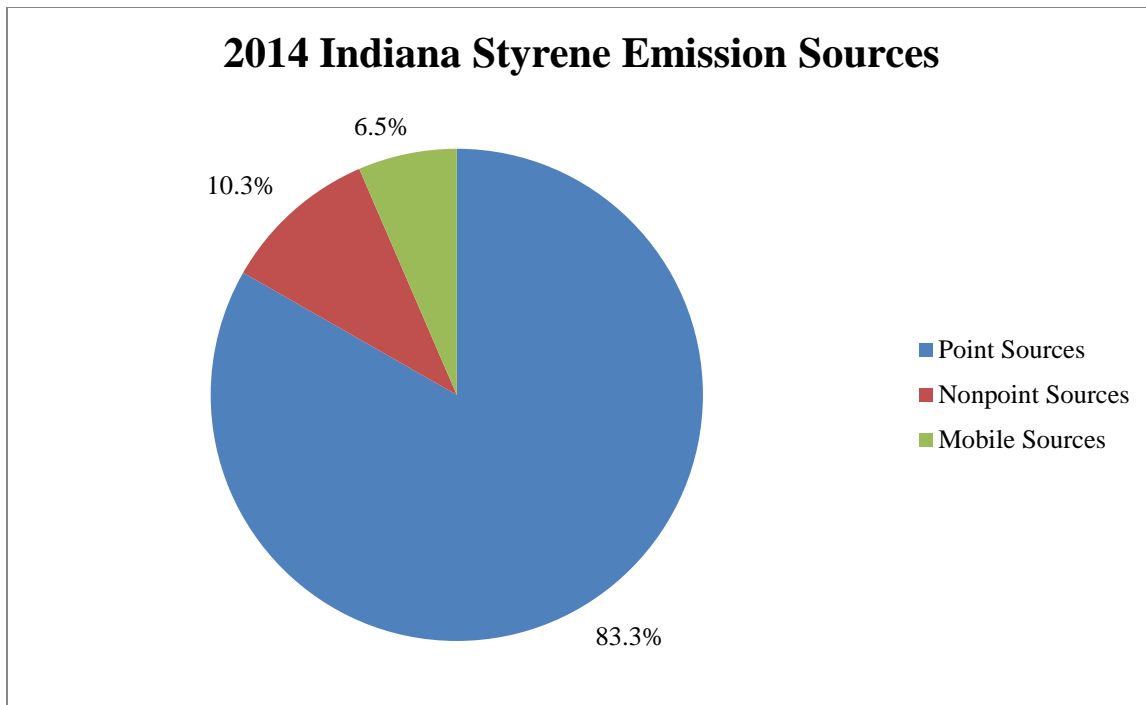
Styrene is a colorless liquid that has a sweet smell. Acute (short-term) inhalation exposure to styrene in humans results in respiratory effects, such as mucous membrane irritation, eye irritation, and gastrointestinal effects. Chronic (long-term) exposure to styrene in humans results in effects on the central nervous system, such as headache, fatigue, weakness, depression, hearing loss, and peripheral neuropathy. Human studies are inconclusive on the reproductive and developmental effects of styrene. Several epidemiologic studies suggest there may be an association between styrene exposure and an increased risk of leukemia and lymphoma. U.S. EPA has not given a formal carcinogen classification to styrene.

Sources

- Styrene is used predominately in the production of polystyrene plastics and resins. Styrene is also used as an intermediate in the synthesis of materials used for ion exchange resins and to produce copolymers.
- Indoor air is the principal route of styrene exposure for the general population. Indoor air levels are attributable to emissions from building materials, consumer products, and tobacco smoke.
- Occupational exposure to styrene occurs in the reinforced plastics industry and polystyrene factories.

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 styrene totaled 1909.23 tons in the 2014 calendar year. Of this total, 83.3% was attributed to point sources, 10.3% was attributed to nonpoint sources, and approximately 6.5% was 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 of styrene for the monitors analyzed from 2006-2015 was 32.5%. This detection rate is too low for IDEM to draw any conclusions about concentration trends of

styrene. IDEM did not perform a trend analysis for any pollutant with a detection rate less than 50%.