

TETRACHLOROETHYLENE (C₂Cl₄)

also known as Perchloroethylene

Chemical Abstracts Service (CAS) Number: 127-18-4

General Information

Tetrachloroethylene is a nonflammable colorless liquid with a sharp sweet odor.

Tetrachloroethylene is widely used for dry-cleaning fabrics and metal degreasing operations. Effects resulting from acute (short term) high-level inhalation exposure of humans to tetrachloroethylene include irritation of the upper respiratory tract and eyes, kidney dysfunction, and neurological effects such as reversible mood and behavioral changes, impairment of coordination, dizziness, headache, sleepiness, and unconsciousness. The primary effects from chronic (long term) inhalation exposure are neurological, including impaired cognitive and motor neurobehavioral performance. Tetrachloroethylene exposure may also cause adverse effects in the kidney, liver, immune system and hematologic system, and on development and reproduction. Studies of people exposed in the workplace have found associations with several types of cancer including bladder cancer, non-Hodgkin lymphoma, multiple myeloma. U.S. EPA has classified tetrachloroethylene as likely to be carcinogenic to humans.

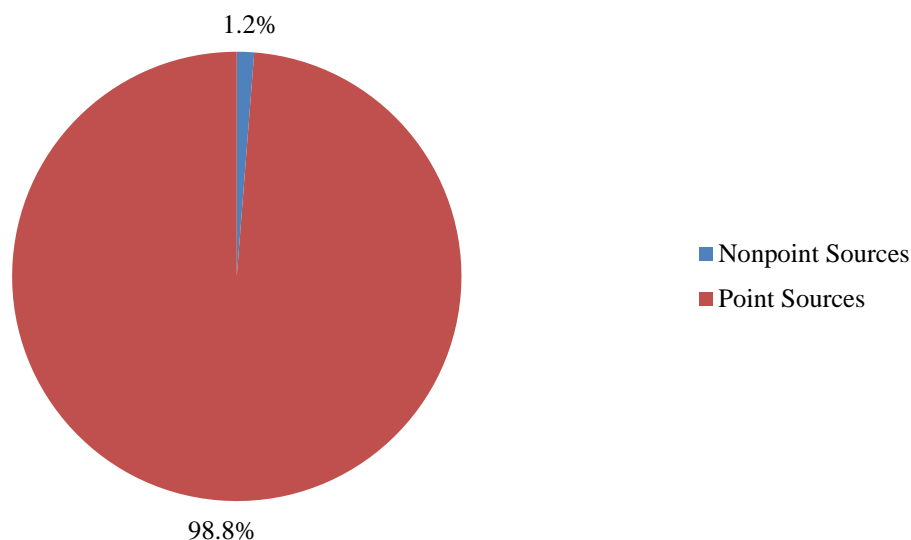
Sources

- Tetrachloroethylene is used for dry cleaning and textile processing, as a chemical intermediate, and for vapor degreasing in metal-cleaning operations.
- Over the past few decades, concentrations of tetrachloroethylene detected in ambient air have declined with reductions in the use of tetrachloroethylene.
- Tetrachloroethylene has also been detected in drinking water supplies from contaminated groundwater sources.
- Occupational exposure to tetrachloroethylene primarily occurs in industries using the chemical (e.g., many dry cleaning facilities) and at industries manufacturing the chemical. New dry cleaning technologies and practices introduced over the past couple of decades result in substantially reduced occupational exposure.

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 tetrachloroethylene totaled 33.83 tons in the 2014 calendar year. Of this total, 98.8% was attributed to point sources, and 1.2% was attributed to nonpoint sources.

2014 Indiana Tetrachloroethylene 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 of tetrachloroethylene for the monitors analyzed from 2006-2015 was 41.6%. This detection rate is too low for IDEM to draw any conclusions about concentration

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