2,2,4-Trimethylpentane

540-84-1

Hazard Summary

2,2,4-Trimethylpentane is released to the environment through the manufacture, use, and disposal of products associated with the petroleum and gasoline industry. During an accident, 2,2,4-trimethylpentane penetrated the skin of a human which caused necrosis of the skin and tissue in the hand and required surgery. No other information is available on the acute (short-term) effects in humans. Irritation of the lungs, edema, and hemorrhage have been reported in rodents acutely exposed by inhalation and injection. No information is available on the chronic (long-term), reproductive, developmental, or carcinogenic effects of 2,2,4-trimethylpentane in humans. Kidney and liver effects have been observed in rats chronically exposed via gavage (experimentally placing the chemical in the stomach) and inhalation. EPA has not classified 2,2,4-trimethylpentane with respect to potential carcinogenicity.

Please Note: The main sources of information for this fact sheet are the Hazardous Substances Data Bank (HSDB) (1), a database of summaries of peer-reviewed literature, and Patty's Industrial Hygiene and Toxicology. (2)

Uses

- 2,2,4-Trimethylpentane is used in determining octane numbers of fuels, in spectrophotometric analysis, as a solvent and thinner, and in organic syntheses. (1,4)

Sources and Potential Exposure

- 2,2,4-Trimethylpentane is released to the environment through the manufacture, use, and disposal of products associated with the petroleum and gasoline industry. Automotive exhaust and evaporative emissions are important sources of 2,2,4-trimethylpentane. The general public may be exposed by the inhalation of ambient air. (1)
- Occupational exposure may occur by inhalation during the refining of petroleum and during the use and disposal of petroleum products and gasoline. (1)

Assessing Personal Exposure

- No information was located regarding the measurement of personal exposure to 2,2,4-trimethylpentane.

Health Hazard Information

Acute Effects:

- During an accident, 2,2,4-trimethylpentane penetrated the skin of a human which caused necrosis of the skin and tissue in the hand and required surgery. No other information is available on the acute effects in humans. (1)
- Irritation of the lungs, edema, and hemorrhage have been reported in rodents acutely exposed by inhalation and injection. (1,2)
- Central nervous system (CNS) depression has been reported in mice following acute inhalation exposure. (1)

Chronic Effects (Noncancer):

- No information is available on the chronic effects of 2,2,4-trimethylpentane in humans.
- Kidney and liver effects have been observed in rats chronically exposed via gavage and inhalation. (1)
- EPA has not established a Reference Concentration (RfC) or a Reference Dose (RfD) for 2,2,4-trimethylpentane. (3)

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of 2,2,4-trimethylpentane in humans or animals.

Cancer Risk:

- No information is available on the carcinogenic effects of 2,2,4-trimethylpentane in humans or animals.
- EPA has not classified 2,2,4-trimethylpentane with respect to potential carcinogenicity. (3)

Physical Properties

- A common synonym for 2,2,4-trimethylpentane is isooctane. (4)
- The chemical formula for 2,2,4-trimethylpentane is C_8H_{18}, and its molecular weight is 114.22 g/mol. (4)
- 2,2,4-Trimethylpentane occurs as a colorless, highly flammable, mobile liquid that is practically insoluble in water. (1,4)
- 2,2,4-Trimethylpentane smells like gasoline; the odor threshold has not been established. (1,4)
- The vapor pressure for 2,2,4-trimethylpentane is 40.6 mm Hg at 21 °C. (1,2)

Note: There are very few health or regulatory/advisory numbers for 2,2,4-trimethylpentane, thus a graph has not been prepared for this compound. The health information cited in this factsheet was obtained in December 1999.

Conversion Factors:
To convert concentrations in air (at 25 °C) from ppm to mg/m^3: mg/m^3 = (ppm) × (molecular weight of the compound)/(24.45). For 2,2,4-trimethylpentane: 1 ppm = 4.67 mg/m^3.

Summary created in April 1992, updated January 2000

References

1. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
2. G.D. Clayton and F.E. Clayton, Eds. Patty's Industrial Hygiene and Toxicology. Volume IIB. 3rd revised ed. John Wiley & Sons, New York. 1981.
3. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on 2,2,4-Trimethylpentane. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
4. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals. 11th ed. Ed. S. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.