

Synthetic Use and Properties of Hexane in Chemistry

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DESCRIPTION

Hexane is used as a special-purpose solvent, a cleaning agent, and to extract edible oils from seeds and vegetables. Humans who are acutely (short-term) inhaled high quantities of hexane experience moderate Central Nervous System (CNS) symptoms such as giddiness, nausea, headache, and dizziness. Humans who are exposed to hexane in the air over an extended period of time may develop polyneuropathy, which manifests as numbness in the extremities, muscle weakness, impaired vision, headaches, and fatigue. Hexane's potential to cause cancer in both humans and animals is unknown. Hexane has been categorised by the EPA as Group D, not classifiable as a human carcinogen.

Alkanes have no colour. Similar to other alkanes, the different hexanes' boiling temperatures are generally lower for the more branched forms. The melting points fluctuate significantly, and no clear pattern can be seen. Crude oil refining is the main method used to make hexanes. The source of the oil (crude or refined) and the refining limitations have a significant impact on the precise composition of the fraction. The percentage boiling at 65-70°C (149-158°F) is the industrial product, which typically accounts for about 50% of the weight of the straight-chain isomer. Hexane typically exhibits mild reactivity and is an appropriate solvent for reactive chemicals, such the majority of alkanes. Nevertheless, methylcyclopentane, which has tertiary C-H bonds and is incompatible with some radical processes, is frequently present in commercial samples of n-hexane.

Quick inhalation hexane exposure at high concentrations in humans results in mild CNS depression. In humans, CNS side effects might cause headaches, giddiness, nausea, and dizziness.

Humans who are exposed to hexane vapours acutely may develop dermatitis and experience eye and throat irritation. Mice exposed via inhalation for a prolonged period of time showed mild inflammatory, erosive, and degenerative lesions in the olfactory and respiratory epithelium of the nasal cavity. In rabbits that had been exposed repeatedly, pulmonary lesions had also been seen.

Hexane's Reference Concentration (RfC) is 0.2 mg/m³ based on studies showing that it is neurotoxic to humans and causes nasal epithelial lesions in mice. The RfC is an estimate of a continuous inhalation dose to the human population, including sensitive subgroups, that is expected to be free from a significant life time risk of adverse noncancerous consequences, with uncertainty spanning maybe an order of magnitude. Instead of serving as a direct risk estimator, it serves as a benchmark for assessing prospective outcomes. The possibility of negative health impacts grows as doses surpass the RfC. Life long exposure exceeding the RfC doesn't necessarily mean that ill effects on health would develop.

The use of hexane is seen in the following fields, which has the chemical formula C₆ H₁₄ and a molecular weight of 86.17 g/mol. Hexane is primarily employed as an oil extraction solvent for vegetable and seed crops (e.g., soybeans, peanuts, corn). Hexane is a common solvent for inks, varnishes, and glues such rubber cement and adhesives. In the printing business, hexane is often employed as a degreaser and cleaning agent. The liquid in low temperature thermometers is hexane. One of the typical laboratory hexanes used is to extract grease and oil contaminants from water and soil for analysis.

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