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JOINT WHO/FAO EXPERT COMMITTEE ON FOOD ADDITIVES
SPECIFICATIONS FOR IDENTITY AND PURITY OF FOOD
ADDITIVES AND THEIR TOXICOLOGICAL ASSESSMENT:
SOLUBLE EXTRACTION SOLVENTS AND CERTAIN OTHER SUBSTANCES
AND
GENERAL CONSIDERATIONS ON ADDITIVES IN BABY FOOD

Chapter 24. Hexane

HEXANE

by

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Biological Data

Biochemical aspects

Aliphatic hydrocarbons are usually considered to be as inert biochemically as they are chemically (Williams, 1959). No information is available on the metabolism of ingested hexane, but of the little hexane absorbed on inhalation most appears to be reexcreted unchanged through the lungs and perhaps a little appears in the urine (Estler, 1939).

Acute toxicity

Animal	Route	LD ₁₀₀ mg/kg bodyweight	Reference
rat	i.p. (at 8°C)	4 000	Keplinger et al., 1959
	i.p. (at 26°C)	9 100	Keplinger et al., 1959
	i.p. (at 36°C)	530	Keplinger et al., 1959

0.2 ml hexane, when aspirated by the anaesthetised rat produced convulsions and death within a few seconds. Cardiac arrest, respiratory paralysis and asphyxia occurred (Gerarde, 1963). Hexane is only a weak anaesthetic but paralyzes the respiratory centre before the spinal reflexes are abolished. It is irritant to skin and mucosa. Acute poisoning in man leads to excitement, delirium, hallucinations, tremor, acrocyanosis and addiction also occurs (Estler, 1939). Inhalation of 5000 ppm for 10 minutes caused dizziness and giddiness in man (Patty, 1958). The U.S. FDA has set a limit of 25 ppm hexane in spice oleoresins. The TVL is 500 ppm (Patty, 1958).

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Chemical studies

None available. Prolonged inhalation causes considerably anemia and nephropathy in animals. Injection of 0.5 - 1.0 cc/kg into animals also lowers the RBC and causes erythroblastosis (Estler, 1939).

Long-term study

None available.

Special studies

Several studies have been undertaken to determine the amount of polycyclic aromatic hydrocarbons in hexane as these may have carcinogenic activity. Some samples have been shown to have less than 0.01 ppm, i.e. the limit of the sensitivity of the method of analysis (Ryder and Sullivan, 1962), but hexane derived from cracking processes may contain traces (Tye et al., 1966). Other investigators have found 0.023 ppm of 3,4-benzopyrene (Lijinsky and Raha, 1961). But polycyclic aromatic hydrocarbons have been detected in such natural products as cold pressed olive oil to an extent of 0.01 - 0.026 ppm (Jung and Morand, 1962) and in other crude untreated oils from 0.0022 - 0.0107 ppm (Grimmet and Hildebrandt, 1967).

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