Safety and Health Topics:
Butane

Safety Topics
Chem Samp Infor
Butan
Ge De
Exp
He
Mo

General Description

Synonyms: n-Butane; Butyl hydride; Diethyl; Methylethylmethane

OSHA IMIS Code Number: 0420

Chemical Abstracts Service (CAS) Registry Number: 106-97-8

NIOSH, Registry of Toxic Effects (RTECS) Identification Number: EJ4200000

Department of Transportation Regulation Number (49 CFR 172.101) and Guide: 1011 115; 1075 115

NIOSH Pocket Guide to Chemical Hazards, n-Butane: chemical description, physical properties, potentially hazardous incompatibilities, and more

Exposure Limits

American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV): See Aliphatic hydrocarbon gases: Alkane [C_1 - C_4] 1000 ppm TWA (Listed under Butane, All isomers)

National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit (REL): 800 ppm, 1900 mg/m^3 TWA

Health Factors

Potential symptoms: Drowsiness, narcosis, asphyxia; cardiac arrhythmia; frostbite from contact with liquid.

Health Effects: Asphyxiant (HE17); Narcosis (HE8); Acute toxicity---sudden death (ventricular fibrillation) (HE4).

Affected organ: CNS

Notes: 1) OSHA does not have a PEL for n-butane, which is affirmed as generally recognized as safe as a direct human food ingredient (21 CFR 184.1165). 2) Gas/air mixtures are explosive. 3) One case of hepatitis due to occupational inhalation of butane and propane has been reported. 4) Metabolized in the body to sec-butanol and methyl ethyl ketone.

Date Last Revised: 02/17/2004

Literature Basis:

- NIOSH Pocket Guide to Chemical Hazards: n-Butane.
- International Chemical Safety Cards (WHO/IPCS/ILO): Butane (liquefied gas).

- Aydin, Y. and Ozcakar L.: Occupational hepatitis due to chronic inhalation of propane and butane. *Int. J. Clin. Pract.* **57**(6): 546, 2003.
- Fuke, C., *et al.*: A fatal case considered to be due to cardiac arrhythmia associated with butane inhalation. *Leg. Med.* (Tokyo) **4**(2): 134-138, 2002.
- Pohanish, R.P. (editor): Butanes. In, *Sittig's Handbook of Toxic and Hazardous Chemicals and Carcinogens, Fourth Ed.*, Vol. 1. Norwich, NY: Noyes Publications, William Andrew Publishing, 2002, pp. 386-388.
- Rohrig, T.P.: Sudden death due to butane inhalation. *Am. J. Forensic Med. Pathol.* **18**(3): 299-302, 1997.
- Tsukamoto, S., Chiba, S., Muto, T., Ishikawa, T. and Shimamura, M.: Study on the metabolism of volatile hydrocarbons in mice-propane, n-butane, and iso-butane. *J. Toxicol. Sci.* **10**(4): 323-332, 1985.

Monitoring Methods used by OSHA

Laboratory Sampling/Analytical Method:

- **sampling media:** Two Carbosieve S-III tubes in series (130/65 mg sections, 60/80 mesh)
  analytical solvent: Carbon Disulfide
  maximum volume: 3 Liters **maximum flow rate:** 0.05 L/min
  current analytical method: Gas Chromatography; GC/FID
  method reference: OSHA Analytical Method (OSHA PV2010)
  method classification: Partially Validated

On-Site Sampling Techniques/Methods:

- **device:** Detector Tube
  manufacturer: AUER/MSA
  model/type: Propane-200, MSA P/N 804418, AUER P/N 5086-831
  sampling information: follow manufacturer's instructions
  upper measurement limit: 3800 ppm
  detection limit: approximately 100 ppm
  overall uncertainty: unknown
  method reference: on-site air secondary (manufacturer)

- **device:** Detector Tube
  manufacturer: Gastec
  model/type: 104
  sampling information: 1 stroke
  upper measurement limit: 1400 ppm
  detection limit: 5 ppm
  overall uncertainty: 16% for 25 to 400 ppm, 8% for 400 to 1400 ppm
  method reference: on-site air secondary (manufacturer)

- **device:** Detector Tube
  manufacturer: Matheson-Kitagawa
  model/type: 8014-221SA
  sampling information: 1 stroke
  upper measurement limit: 0.6%
  detection limit: approximately 0.02%
  overall uncertainty: unknown
  method reference: on-site air secondary (manufacturer)

Back to Top www.osha.gov

Contact Us | Freedom of Information Act | Customer Survey
Privacy and Security Statement | Disclaimers

Occupational Safety & Health Administration
200 Constitution Avenue, NW
Washington, DC 20210

Page last updat