

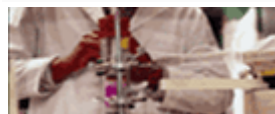


U.S. Department of Labor
Occupational Safety & Health Administration

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Safety and Health Topics: Butane

[Safety Topics](#)

[Chemical Sampling Information](#)
[Butane](#)
[General Description](#)
[Exposure Limits](#)
[Health Factors](#)
[Monitoring](#)

General Description

Synonyms: n-Butane; Butyl hydride; Diethyl; Methylene methane

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 [C₁ - C₄] 1000 ppm TWA (Listed under Butane, All isomers)

National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit (REL): 800 ppm, 1900 mg/m³ 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)

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