Safety and Health Topics: Butane

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:** FJ4200000

**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/IL0): Butane (liquefied gas).


**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](http://www.osha.gov/dts/chemicalsampling/data/CH_222200.html))
  - **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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