ionz

SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Butane
Catalog Number : io-1862
CAS Number : 106-97-8
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

Flammable liquid (category 2)
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

Pictogram(s)

GHS Hazard Statements

>> H220 (99.8%): Extremely flammable gas [Danger Flammable gases]

>> H280 (32.8%): Contains gas under pressure; may explode if heated [Warning Gases under pressure]

Precautionary Statement Codes

>> P203, P210, P222, P280, P377, P381, P403, and P410+P403

NFPA 704 Diamond

NFPA Health Rating

>> 1 - Materials that, under emergency conditions, can cause significant irritation.

NFPA Fire Rating

>> 4 - Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.

NFPA Instability Rating

>> 0 - Materials that in themselves are normally stable, even under fire conditions.

Health Hazards:

>> High exposure produces drowsiness but no other evidence of systemic effect. (USCG, 1999)

ERG 2024, Guide 115 (Butane)

>> Vapors may cause dizziness or asphyxiation without warning, especially when in closed or confined areas.

>> Some may be irritating if inhaled at high concentrations.

>> Contact with gas, liquefied gas or cryogenic liquids may cause burns, severe injury and/or frostbite.

>> Fire may produce irritating and/or toxic gases.

>> Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]:

>> EXTREMELY FLAMMABLE. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Vapors from liquefied gas are initially heavier than air and spread along ground. CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966), Methane (UN1971) and Hydrogen and Methane mixture, compressed (UN2034) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.) Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. CAUTION: When LNG - Liquefied natural gas (UN1972) is released on or near water, product may vaporize explosively. (ERG, 2024)

ERG 2024, Guide 115 (Butane)

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>> Vapors may travel to source of ignition and flash back.

>> Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.

>> Containers may explode when heated.

>> Ruptured cylinders may rocket.

>> CAUTION: When LNG - Liquefied natural gas (UN1972) is released on or near water, product may vaporize explosively.

>> Extremely flammable. Gas/air mixtures are explosive.

3. Composition/Information On Ingredients

Chemical name : Butane
CAS Number : 106-97-8
Molecular Formula : C4H10
Molecular Weight : 58.1200 g/mol

4. First Aid Measures

First Aid:

>> EYES: First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. If symptoms (such as redness or irritation) develop, immediately transport the victim to a hospital.

>> SKIN: CAUTION: Exposure of skin to compressed gases may result in freezing of the skin. Treatment for frostbite may be necessary. Remove the victim from the source of contamination. IMMEDIATELY wash affected areas gently with COLD water (and soap, if necessary) while removing and isolating all contaminated clothing. Dry carefully with clean, soft towels. If symptoms such as inflammation or irritation develop, IMMEDIATELY call a physician or go to a hospital for treatment.

>> INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere.

Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

>> INGESTION: This compound is a gas, therefore inhalation is the first route of exposure. (NTP, 1992)

ERG 2024, Guide 115 (Butane)

>> General First Aid:

>> Call 911 or emergency medical service.

>> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

>> Move victim to fresh air if it can be done safely.

>> Administer oxygen if breathing is difficult.

>> If victim is not breathing:

>> DO NOT perform mouth-to-mouth resuscitation; the victim may have ingestedor inhaled the substance.

>> If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).

>> If no pulse detected or no respiratory medical device available, provide continuouscompressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.

>> Remove and isolate contaminated clothing and shoes.

>> For minor skin contact, avoid spreading material on unaffected skin.

>> In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.

>> For severe burns, immediate medical attention is required.

>> Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

>> Keep victim calm and warm.

>> Keep victim under observation.

>> For further assistance, contact your local Poison Control Center.

>> Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.

>> Specific First Aid:

>> Clothing frozen to the skin should be thawed before being removed.

>> In case of contact with liquefied gas, only medical personnel should attempt thawing frosted parts.

>> In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.

>> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

First Aid Measures

Inhalation First Aid

>> Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

Skin First Aid

>> ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention .

Eye First Aid

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

5. Fire Fighting Measures

>> On loss of containment this substance can cause suffocation by lowering the oxygen content of the air in confined areas... Rapid evaporation of the liquied may cause frostbite. The substance may cause effects on the central nervous system.

>> Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]:

>> DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Hydrogen and Methane mixture, compressed (UN2034) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.).

>> SMALL FIRE: Dry chemical or CO2.

>> LARGE FIRE: Water spray or fog. If it can be done safely, move undamaged containers away from the area around the fire. CAUTION: For LNG - Liquefied natural gas (UN1972) pool fires, DO NOT USE water. Use dry chemical or high-expansion foam.

>> FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks in direct contact with flames. For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn. (ERG, 2024)

>> Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with powder, carbon dioxide. In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

6. Accidental Release Measures

Isolation and Evacuation:

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

>> LARGE SPILL: Consider initial downwind evacuation for at least 800 meters (1/2 mile).

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions. In fires involving Liquefied Petroleum Gases (LPG) (UN1075), Butane (UN1011), Butylene (UN1012), Isobutylene (UN1055), Propylene (UN1077), Isobutane (UN1969), and Propane (UN1978), also refer to the "BLEVE - Safety Precautions" section. (ERG, 2024)

Evacuation: ERG 2024, Guide 115 (Butane)

>> Immediate precautionary measure

>> Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

>> Large Spill

>> Consider initial downwind evacuation for at least 800 meters (1/2 mile).

>> Fire

>> If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

>> In fires involving Liquefied Petroleum Gases (LPG) (UN1075), Butane (UN1011), Butylene (UN1012), Isobutylene (UN1055), Propylene (UN1077), Isobutane (UN1969), and Propane (UN1978), also refer to the "BLEVE - Safety Precautions" section.

Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Remove all ignition sources. NEVER direct water jet on liquid.

Accidental Release Measures

Public Safety: ERG 2024, Guide 115 (Butane)

>> CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.

>> Keep unauthorized personnel away.

>> Stay upwind, uphill and/or upstream.

>> Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

Spill or Leak: ERG 2024, Guide 115 (Butane)

>> ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.

>> All equipment used when handling the product must be grounded.

>> Do not touch or walk through spilled material.

>> Stop leak if you can do it without risk.

>> If possible, turn leaking containers so that gas escapes rather than liquid.

>> Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.

>> Do not direct water at spill or source of leak.

>> CAUTION: For LNG - Liquefied natural gas (UN1972), DO NOT apply water, regular or alcohol-resistant foam directly on spill. Use a high-expansion foam if available to reduce vapors.

>> Prevent spreading of vapors through sewers, ventilation systems and confined areas.

>> Isolate area until gas has dispersed.

>> CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

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>> CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

7. Handling And Storage

Safe Storage:

>> Fireproof. Cool.

Storage Conditions:

>> Butane in liquid form may be stored both above and below ground. Besides storage in liquefied form under its vapor pressure at normal atmospheric temperatures, refrigerated liquid storage at atmospheric pressure may be used. Such systems are closed and insulated, and the liquid petroleum gas vapor is circulated through pumps and compressors to serve as the refrigerant for the system. Butane may be stored in pits in the earth capped by metal domes and in underground chambers.

8. Exposure Control/ Personal Protection

REL-TWA (Time Weighted Average)

>> 800 ppm (1900 mg/m³)

>> TWA 800 ppm (1900 mg/m³)

>> none See Appendix G

TLV-STEL

>> 1000.0 [ppm]

>> 15 min Short Term Exposure Limit (STEL): 1000 ppm

>> 1000 ppm as STEL.

TLV-TWA (Time Weighted Average)

>> 1000 ppm [2012]

MAK (Maximale Arbeitsplatz Konzentration)

>> 2400 mg/m

Emergency Response: ERG 2024, Guide 115 (Butane)

>> DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

>> CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Hydrogen and Methane mixture, compressed (UN2034) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

>> Small Fire

>> Dry chemical or CO2.

>> Large Fire

>> Water spray or fog.

>> If it can be done safely, move undamaged containers away from the area around the fire.

>> CAUTION: For LNG - Liquefied natural gas (UN1972) pool fires, DO NOT USE water. Use dry chemical or high-expansion foam.

>> Fire Involving Tanks

>> Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.

>> Cool containers with flooding quantities of water until well after fire is out.

>> Do not direct water at source of leak or safety devices; icing may occur.

>> Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

>> ALWAYS stay away from tanks in direct contact with flames.

>> For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Inhalation Risk:

>> On loss of containment this substance can cause suffocation by lowering the oxygen content of the air in confined areas.

Effects of Short Term Exposure:

>> Rapid evaporation of the liquid may cause frostbite. The substance may cause effects on the central nervous system.

Fire Prevention

>> NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding) if in liquid state. Use non-sparking handtools.

Inhalation Prevention

>> Use closed system or ventilation.

Skin Prevention

>> Cold-insulating gloves. Protective clothing.

Eye Prevention

>> Wear face shield.

Exposure Control and Personal Protection

Protective Clothing: ERG 2024, Guide 115 (Butane)

>> Wear positive pressure self-contained breathing apparatus (SCBA).

>> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

>> Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

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>> Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

Maximum Allowable Concentration (MAK)

>> 1000.0 [ppm]

9. Physical And Chemical Properties

Molecular Weight:

>> 58.12

Exact Mass:

>> 58.078250319

Physical Description:

>> Butane is a colorless gas with a faint petroleum-like odor. For transportation it may be stenched. It is shipped as a liquefied gas under its vapor pressure. Contact with the liquid can cause frostbite. It is easily ignited. Its vapors are heavier than air. Any leak can be either liquid or vapor. Under prolonged exposure to fire or intense heat the containers may rupture violently and rocket. It is used as a fuel, an aerosol propellant, in cigarette lighters, and to make other chemicals.

>> ODOURLESS COLOURLESS COMPRESSED LIQUEFIED GAS.

Color/Form:

>> Colorless gas [Note: Shipped as a liquefied compressed gas. A liquid below 31 degrees F]

Odor:

>> Faint, disagreeable odor

Boiling Point:

>> 31.1 °F at 760 mmHg (NTP, 1992)

>> -0.5 °C

Melting Point:

>> -217.1 °F (NTP, 1992)

>> -138 °C

Flash Point:

>> -76 °F (NTP, 1992)

>> -60 °C

Solubility:

>> 61 mg/L at 68 °F (NTP, 1992)

>> Solubility in water, g/100ml at 20 °C: 0.0061

Density:

>> 0.6 at 32 °F (USCG, 1999) - Less dense than water; will float

>> Relative density (water = 1): 0.6

Vapor Density:

>> 2.046 (NTP, 1992) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 2.1

Vapor Pressure:

>> 760 mmHg at 31.1 °F ; 1823 mmHg at 77 °F (NTP, 1992)

>> Vapor pressure, kPa at 21.1 °C: 213.7

LogP:

>> log Kow = 2.89

>> 2.89

Autoignition Temperature:

>> 550 °F (USCG, 1999)

>> 365 °C

Decomposition:

>> When heated to decomposition it emits acrid smoke and fumes.

Viscosity:

>> 7.5 at 300 K; 9.9 at 400 K; 12.2 at 500 K; 14.5 at 600 K (all in uPa.s) (gas)

Corrosivity:

The ability of a chemical to damage or destroy other substances when it comes into contact.

>> Has no corrosive action on metals

Heat of Combustion:

>> -19,512 BTU/lb= -10,840 cal/g= -453.85x10+5 J/kg

Heat of Vaporization:

>> 22.39 kJ/mol at normal BP

Surface Tension:

>> 14.7 dynes/cm at 0 °C

Ionization Potential:

>> 10.63 eV

Odor Threshold:

>> Odor Threshold Low: 1.2 [ppm]

>> Odor Threshold High: 6.5 [ppm]

>> Odor threshold from ACGIH

Refractive Index:

>> Index of refraction: 1.3326 at 20 °C/D

10. Stability And Reactivity

>> Highly flammable.

>> Highly Flammable

11. Toxicological Information

Toxicity Summary:

>> n-Butane is a colorless, flammable gas at room temperature. It occurs as a component in natural gas from which it is refined. n-Butane is used as fuel, refrigerant and aerosol propellant. The acute toxicity of n-butane has been studied after inhalation exposure in experimental animals. LC50 (4h) was 658 mg/l in rats and LC50 (2h) was 680 mg/l in mice. In dogs, lethal concentrations ranged from 474 to 592 mg/l. A concentration of 308 mg/l caused light anesthesia in mice within 25 minutes, and an exposure to 521 mg/l had similar effect within one minute. n-Butane ... sensitiz/ed/ the myocardium to epinephrine-induced cardiac arrhythmias in dogs after inhalation. No reports on acute toxicity of n-butane in experimental animals by other administration routes were located in the available literature. In a 21-day inhalation toxicity study of a mixture of n-butane, isobutane, n-penta and isopentane, containing 25% of each, the absence of toxicity was evident up to 11.8 mg/l which was the highest concentration tested. The study was performed in Sprague-Dawley rats which were exposed 6 hours per day over three weeks for a total of 15 exposures. No long-term studies using pure n-butane were located in the available literature. No mutagenic activity was observed in several tests in Salmonella typhimurium strains TA 1535, TA 1537, TA 1538, TA 98 and TA 100 with or without the addition of an exogenous metabolism system. No studies on carcinogenicity, reproduction toxicity and teratogenicity, immunotoxicity or allergy were located in the available literature. Several reports on human exposure to n-butane were available. The increasing abuse of volatile substances, n-butane being among them, increases the risk of sudden death in connection to inhalation of the gas. The range of concentrations that may lead to "high" feelings or to death has been noted to be very narrow. The use of a oven cleaner containing n-butane as propellant has caused transient myoclonus in one patient. No other physical abnormalities were noted. An aerosol spray which contained n-butane as propellant, was reported to cause deep frostbite symptoms ir the skin when sprayed directly on it. Because of the anesthetic effect of n-butane, truck drivers and terminal operators from different loading facilities and service stations were examined for exposure gasoline vapours containing 90 to 92 percent n-butane, isobutane, n-pentane and isopentane. Exposures to the gasoline vapor were substantially lower than the established ACGIH threshold values (300 ppm or 0.89 mg/l for gasoline, and 800 ppm or 1.9 mg/l for n-butane). Occupational exposure of 53 male refinery workers for an average of 11 years to n-butane (concentration varied from 0.0004 mg/l to 0.0178 mg/l) did not cause any clinical symptoms in the workers. ... In conclusion, exposure to low concentrations of n-butane has not been reported to cause adverse effects in humans. It is anesthetic to both humans and experimental animals. Sudden death may occur when n-butane is inhaled at high concentrations. The safety margin between anesthetic and lethal concentrations appears to be very narrow. Chronic exposure to n-butane has been reported to cause some symptoms in the central nervous system. Critical effects might be lethality when inhaled in high doses, and effects on the central nervous system in chronically exposed individuals.

USGS Health-Based Screening Levels for Evaluating Water-Quality:

This section provides the USGS Health-Based Screening Levels for Evaluating Water-Quality data.

Chemical

>> Butane

Reference

>> Smith, C.D. and Nowell, L.H., 2024. Health-Based Screening Levels for evaluating water-quality data (3rd ed.). DOI:10.5066/F71C1TWP

Carcinogen Classification:

This section provides the International Agency for Research on Cancer (IARC) Carcinogenic Classification and related monograph links. In the IARC Carcinogenic classification, chemicals are categorized into four groups: Group 1 (carcinogenic to humans), Group 2A (probably carcinogenic to humans), Group 2B (possibly carcinogenic to humans), and Group 3 (not classifiable as to its carcinogenicity to humans).

>> n-Butane is found in gasoline, which is possibly carcinogenic to humans (Group 2B). (L135)

Health Effects:

>> Butane targets the central nervous system and cardiovascular system. Inhalation of butane can cause frostbite which can result in death from asphyxiation and ventricular fibrillation. (L1283, L1284)

Exposure Routes:

>> The substance can be absorbed into the body by inhalation.

>> inhalation, skin and/or eye contact (liquid)

Inhalation Exposure

>> Drowsiness. Unconsciousness.

Skin Exposure

>> ON CONTACT WITH LIQUID: FROSTBITE.

Eye Exposure

>> ON CONTACT WITH LIQUID: FROSTBITE.

>> drowsiness, narcosis, asphyxia; liquid: frostbite

Target Organs:

Organs that are affected by exposure to this chemical. Information in this section reflects human data unless otherwise noted.

>> central nervous system

Adverse Effects:

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Neurotoxin - Acute solvent syndrome

>> Other Poison - Simple Asphyxiant

Toxicity Data:

>> LC50 (rat) = 658,000 mg/m3

Treatment:

Treatment when exposed to toxin

>> Treatment for butane poisoning is supportive and symptomatic. Stimulants should not be administered. Recovery normally occurs quickly once exposure has ceased but support of the cardiovascular and respiratory systems may be needed. (L1284)

Interactions:

>> ... Mixing butane and isobutylene produced an additive ... /CNS depressant/ effect in 2 of 12 mice and a potentiating effect in the remaining 10 animals. In rats, the butane-isobutylene mixture showed a summation of effects in 9 of 12 animals and a potentiation of effects in the remaining animals.

Antidote and Emergency Treatment:

>> FIRST AID: Skin--ON CONTACT WITH LIQUID FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention; Eyes--ON CONTACT WITH LIQUID FROSTBITE. First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Human Toxicity Excerpts:

>> /HUMAN EXPOSURE STUDIES/ Mildly toxic by inhalation. Causes drowsiness. An asphyxiant.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Butane is an essentially nontoxic petroleum gas that causes no disturbance of the eye, even when injected into the anterior chamber experimentally in rabbits, disappearing spontaneously from the eye in 2 to 4 days.

Non-Human Toxicity Values:

>> LC50 Rat inhalation 658 mg/l/4 hr

TSCA Test Submissions:

Under the Toxic Substances Control Act (TSCA), EPA has broad authority to issue regulations designed to require manufacturers (including importers) or processors to test chemical substances and mixtures for health and environmental effects. This section provides information on test reports submitted for this chemical under TSCA.

>> Butadiene Feedstock, a mixture containing 1,3-butadiene (40-69%), 1-butene (11-19%), isobutene (5-20%), and mixed butenes and butane (7-24%), was evaluated for the potential to induce chromosomal damage. Crl:CDR-1(ICR)BR Swiss mice (10/sex/group) were exposed to target concentrations of 0, 10,000, 20,000, or 30,000 ppm (actual average concentrations were 0, 10,802, 20,671, or 35,430 ppm, respectively) by inhalation 2 hours/day for 2 consecutive days. A positive control group of 5 males and 5 females received one intraperitoneal injection of cyclophosphamide (75 mg/kg) on each of two days. Animals were sacrificed and bone marrow smears were prepared on days 3 and 4. Expected results were obtained from positive and negative control groups exposed to cyclophosphamide and air-only, respectively. Females at all dose levels showed a significant, dose-related increase in micronucleus formation over controls on both days. Males showed a significant increase only at 35430 ppm on both days. There was a decrease in micronucleated erythrocytes on day 4 in both sexes at all dose levels.

12. Ecological Information

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: n-Butane was detected in 10 of 10 sediment samples from Walvis Bay of the Namibian shelf of SW Africa at concentrations of 2.2, 0.45, 2.2, 1.5, 0.31, 0.24, 0.01, 0.22, 0.52, and 0.27 ng/g(1). Sediments from the Bering Sea contained n-butane gas at concentrations ranging from 4 to 43 nL/L(2).

Average Daily Intake:

The average amount of the compound taken into the body through eating, drinking, or breathing.

>> According to the National Ambient Volatile Organic Compounds (VOCs) Database, the median urban atmospheric concn of n-butane is 9.174 ppbV for 546 samples(1). Based upon this figure and the value for average daily inhalation by a human adult of 20 cu m of air, the average daily intake of n-butane via air is 183 mg.

13. Disposal Considerations

Spillage Disposal

>> Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Remove all ignition sources. NEVER direct water jet on liquid.

Disposal Methods

>> Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

>> SRP: Wastewater from contaminant suppression, cleaning of protective clothing/equipment, or contaminated sites should be contained and evaluated for subject chemical or decomposition product concentrations. Concentrations shall be lower than applicable environmental discharge or disposal criteria. Alternatively, pretreatment and/or discharge to a permitted wastewater treatment facility is acceptable only after review by the governing authority and assurance that "pass through" violations will not occur. Due consideration shall be given to remediation worker exposure (inhalation, dermal and ingestion) as well as fate during treatment, transfer and disposal. If it is not practicable to manage the chemical in this fashion, it must be evaluated in accordance with EPA 40 CFR Part 261, specifically Subpart B, in order to determine the appropriate local, state and federal requirements for disposal.

14. Transport Information

DOT

Butane
2.1

IATA

Butane
2.1,

15. Regulatory Information

DHS Chemicals of Interest (COI):

This section provides the Department of Homeland Security (DHS) Chemicals of Interest (COI) and related information (Ref: 6 eCFR part 27 - https://www.ecfr.gov/current/title-6/chapter-I/part-27).

Chemicals of Interest(COI)

>> Butane

Release: Minimum Concentration (%)

>> 1

Release: Screening Threshold Quantities (in pounds)

>> 10000

Security Issue: Release - Flammables

>> Flammable chemical that can be released at a facility.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Butane

REACH Registered Substance

>> Status: Active Update: 02-03-2023 https://echa.europa.eu/registration-dossier/-/registered-dossier/15434

New Zealand EPA Inventory of Chemical Status

>> Butane: HSNO Approval: HSR000989 Approved with controls

16. Other Information

Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> Hazardous decomposition products formed under fire conditions. -Carbon oxides.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Butane: Human health tier I assessment

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."