

## 1. Material Identification

**Product Name** : sec-Butyl acetate

**Catalog Number** : io-1876

**CAS Number** : 105-46-4

**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)

### Note

>> Pictograms displayed are for 95.1% (308 of 324) of reports that indicate hazard statements. This chemical does not meet GHS hazard criteria for 4.9% (16 of 324) of reports.

### Pictogram(s)



### GHS Hazard Statements

>> H225 (94.8%): Highly Flammable liquid and vapor [Danger Flammable liquids]

### Precautionary Statement Codes

>> P210, P233, P240, P241, P242, P243, P280, P303+P361+P353, P370+P378, P403+P235, and P501

### NFPA 704 Diamond



### NFPA Health Rating

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

### NFPA Fire Rating

>> 3 - Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions.

### NFPA Instability Rating

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

### Health Hazards:

>> Headaches, dizziness, nausea, irritation of respiratory passage and eyes. (USCG, 1999)

#### ERG 2024, Guide 129 (Butyl acetates)

- >> May cause toxic effects if inhaled or absorbed through skin.
- >> Inhalation or contact with material may irritate or burn skin and eyes.
- >> Fire will produce irritating, corrosive and/or toxic gases.
- >> Vapors may cause dizziness or asphyxiation, especially when in closed or confined areas.
- >> Runoff from fire control or dilution water may cause environmental contamination.
  
- >> Excerpt from ERG Guide 129 [Flammable Liquids (Water-Miscible / Noxious)]:
- >> HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.). Vapor explosion hazard indoors, outdoors or in sewers. Those substances designated with a (P) may polymerize explosively when heated or involved in a fire. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Many liquids will float on water. (ERG, 2024)

#### ERG 2024, Guide 129 (Butyl acetates)

- >> HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
- >> Vapors may form explosive mixtures with air.
- >> Vapors may travel to source of ignition and flash back.
- >> Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- >> Vapor explosion hazard indoors, outdoors or in sewers.
- >> Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- >> Runoff to sewer may create fire or explosion hazard.
- >> Containers may explode when heated.
- >> Many liquids will float on water.
- >> Highly flammable. Vapour/air mixtures are explosive.

### 3. Composition/Information On Ingredients

**Chemical name** : sec-Butyl acetate

**CAS Number** : 105-46-4

**Molecular Formula** : C<sub>6</sub>H<sub>12</sub>O<sub>2</sub>

**Molecular Weight** : 116.1600 g/mol

### 4. First Aid Measures

#### First Aid:

- >> Excerpt from NIOSH Pocket Guide for sec-Butyl acetate:
- >> Eye: IRRIGATE IMMEDIATELY – If this chemical contacts the eyes, immediately wash (irrigate) the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately.
- >> Skin: WATER FLUSH PROMPTLY – If this chemical contacts the skin, flush the contaminated skin with water promptly. If this chemical penetrates the clothing, immediately remove the clothing and flush the skin with water promptly. If irritation persists after washing, get medical attention.
- >> Breathing: RESPIRATORY SUPPORT – If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical attention as soon as possible.
- >> Swallow: MEDICAL ATTENTION IMMEDIATELY – If this chemical has been swallowed, get medical attention immediately. (NIOSH, 2024)

#### ERG 2024, Guide 129 (Butyl acetates)

- >> 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 ingested or 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 continuous compressions. 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:
- >> Wash skin with soap and water.
- >> 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. Refer for medical attention.

##### **Skin First Aid**

- >> Remove contaminated clothes. Rinse and then wash skin with water and soap.

##### **Eye First Aid**

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

##### **Ingestion First Aid**

- >> Rinse mouth. Do NOT induce vomiting. Refer for medical attention .

## **5. Fire Fighting Measures**

- >> Flashback along vapor trail may occur.
- >> Fire Extinguishing Agents Not to Be Used: Water may be ineffective
- >> Fire Extinguishing Agents: Foam, carbon dioxide, or dry chemical (USCG, 1999)
- >> Use foam, alcohol-resistant foam, dry powder, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

## 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 129 [Flammable Liquids (Water-Miscible / Noxious)]:
- >> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- >> LARGE SPILL: Consider initial downwind evacuation for at least 300 meters (1000 feet).
- >> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

### Evacuation: ERG 2024, Guide 129 (Butyl acetates)

- >> Immediate precautionary measure
- >> Isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- >> Large Spill
- >> Consider initial downwind evacuation for at least 300 meters (1000 feet).
- >> Fire
- >> If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

### Spillage Disposal:

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

- >> Remove all ignition sources. Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT wash away into sewer.

## Accidental Release Measures

### Public Safety: ERG 2024, Guide 129 (Butyl acetates)

- >> 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.
- >> Ventilate closed spaces before entering, but only if properly trained and equipped.

### Spill or Leak: ERG 2024, Guide 129 (Butyl acetates)

- >> 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.
- >> Prevent entry into waterways, sewers, basements or confined areas.
- >> A vapor-suppressing foam may be used to reduce vapors.
- >> Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- >> Use clean, non-sparking tools to collect absorbed material.
- >> Large Spill
- >> Dike far ahead of liquid spill for later disposal.
- >> Water spray may reduce vapor, but may not prevent ignition in closed spaces.

## 7. Handling And Storage

### Safe Storage:

>> Fireproof. Separated from strong oxidants, strong bases and strong acids.

### Storage Conditions:

>> IN GENERAL, MATERIALS WHICH ARE TOXIC AS STORED OR WHICH CAN DECOMP INTO TOXIC COMPONENTS DUE TO CONTACT WITH HEAT, MOISTURE, ACIDS OR ACID FUMES, SHOULD BE STORED IN A COOL, WELL-VENTILATED PLACE, OUT OF DIRECT RAYS OF SUN, AWAY FROM AREAS OF HIGH FIRE HAZARD, & ... PERIODICALLY INSPECTED & MONITORED.

## 8. Exposure Control/ Personal Protection

### REL-TWA (Time Weighted Average)

- >> 200 ppm (950 mg/m<sup>3</sup>)
- >> TWA 200 ppm (950 mg/m<sup>3</sup>)
- >> 200.0 [ppm]

### PEL-TWA (8-Hour Time Weighted Average)

- >> 200 ppm (950 mg/m<sup>3</sup>)
- >> 50.0 [ppm]

### TLV-STEL

- >> 150.0 [ppm]
- >> 50 ppm as TWA; 150 ppm as STEL.

### TLV-TWA (Time Weighted Average)

- >> 50 ppm [2015]

### TLV-STEL (Short Term Exposure Limit)

- >> 150 ppm [2015]

### EU-OEL

- >> 241 mg/m

### Emergency Response: ERG 2024, Guide 129 (Butyl acetates)

- >> CAUTION: The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.
- >> Small Fire
- >> Dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam.
- >> Do not use dry chemical extinguishers to control fires involving nitromethane (UN1261) or nitroethane (UN2842).
- >> Large Fire
- >> Water spray, fog or alcohol-resistant foam.
- >> Avoid aiming straight or solid streams directly onto the product.
- >> If it can be done safely, move undamaged containers away from the area around the fire.
- >> Fire Involving Tanks, Rail Tank Cars or Highway 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.
- >> 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:

- >> A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20 °C.

### Effects of Short Term Exposure:

- >> The vapour is mildly irritating to the eyes and respiratory tract. The substance may cause effects on the central nervous system. Exposure far above the OEL could cause lowering of consciousness.

### Effects of Long Term Exposure:

- >> The substance defats the skin, which may cause dryness or cracking.

### Fire Prevention

- >> NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.

### Inhalation Prevention

- >> Use ventilation, local exhaust or breathing protection.

### Skin Prevention

- >> Protective gloves.

### Eye Prevention

- >> Wear safety spectacles.

### Ingestion Prevention

- >> Do not eat, drink, or smoke during work.

### Exposure Control and Personal Protection

#### Protective Clothing: ERG 2024, Guide 129 (Butyl acetates)

- >> Wear positive pressure self-contained breathing apparatus (SCBA).
- >> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

## 9. Physical And Chemical Properties

### Molecular Weight:

- >> 116.16

### Exact Mass:

- >> 116.083729621

### Physical Description:

- >> Watery colorless liquid with a pleasant, fruity odor. Floats on water. Produces irritating vapor. (USCG, 1999)
- >> COLOURLESS LIQUID WITH CHARACTERISTIC ODOUR.

### Color/Form:

- >> Colorless liquid

### Odor:

- >> HAS FRUITY ODOR CHARACTERISTIC OF ACETATE ESTERS

### Boiling Point:

- >> 234 °F at 760 mmHg (USCG, 1999)
- >> 112 °C

### Melting Point:

- >> -100 °F (USCG, 1999)
- >> -99 °C

### Flash Point:

- >> 62 °F (USCG, 1999)
- >> 17 °C c.c.

### Solubility:

- >> 0.8 % (NIOSH, 2024)
- >> Solubility in water, g/100ml at 20 °C: 0.8

**Density:**

- >> 0.872 at 68 °F (USCG, 1999) – Less dense than water; will float
- >> Relative density (water = 1): 0.87

**Vapor Density:**

- >> 4.0 (Air = 1)
- >> Relative vapor density (air = 1): 4.0

**Vapor Pressure:**

- >> 51.7 mmHg (USCG, 1999)
- >> Vapor pressure, kPa at 20 °C: 1.33

**LogP:**

- >> log Kow = 1.72
- >> 1.51

**Stability/Shelf Life:**

- >> Heat /contributes to instability/.

**Decomposition:**

- >> When heated to decomp it emits acrid smoke and irritating fumes.

**Surface Tension:**

- >> 23.3 dynes/cm = 0.0233 N/m at 21 °C

**Ionization Potential:**

- >> 9.91 eV

**Odor Threshold:**

- >> Odor Threshold Low: 3.0 [mmHg]
- >> Odor Threshold High: 7.0 [mmHg]
- >> Odor threshold from "Quick Guide: The Electronic NIOSH Pocket Guide to Chemical Hazards"

**Refractive Index:**

- >> Index of refraction: 1.3888 at 20 °C

**Relative Evaporation Rate:**

The rate at which a material will vaporize (evaporate, change from liquid to vapor), compared to the rate of vaporization of a specific known material.

- >> 2.0 (Butyl acetate = 1)

## 10. Stability And Reactivity

- >> Highly flammable. Water soluble.
- >> Highly Flammable

## 11. Toxicological Information

**Exposure Routes:**

- >> The substance can be absorbed into the body by inhalation of its vapour.
- >> inhalation, ingestion, skin and/or eye contact

**Inhalation Exposure**

>> Cough. Sore throat. Dizziness. Headache.

#### **Skin Exposure**

>> Dry skin.

#### **Eye Exposure**

>> Redness.

#### **Ingestion Exposure**

>> Nausea.

>> irritation eyes; headache; drowsiness; dryness upper respiratory system, skin; narcosis

#### **Target Organs:**

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

>> Eyes, skin, respiratory system, 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

#### **Toxicity Data:**

>> LCLo (rat) = 24,000 ppm/4h

#### **Antidote and Emergency Treatment:**

>> Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Esters and related compounds/

#### **Human Toxicity Excerpts:**

>> /HUMAN EXPOSURE STUDIES/ A study of sensory irritation (nasal pungency) associated with a series of homologous ketones and secondary and tertiary alcohols and esters was conducted. The study group consisted of three men and one woman, 41 to 65 years old, who lacked a sense of smell (anosmics) and three men and one woman 41 to 68 years old, with normal olfaction (normosmics). The subjects were exposed to 2-propanone (67641), 2-pentanone (107879), 2-heptanone (110430), 2-nonanone (821556), 2-propanol (67630), 2-methyl-2-propanol (75650), 2-butanol (78922), 4-heptanol (589559), tert-butyl-acetate (540885), and sec-butyl-acetate (105464) vapors at concentrations of  $1 \times 10^{-2}$  to  $1 \times 10^6$  ppm by sniffing bottles containing the solvents. They also sniffed bottles containing a blank (nonodoriferous solvent). The subjects were asked to estimate the concentration of each solvent at which they could first detect the odor and perceive nasal pungency. Attempts were made to correlate the thresholds with the concentration of the saturated vapor at ambient temperature (23 °C). Both the normosmics and anosmics could detect the solvent vapors; however, the normosmics detected the vapors at much lower concentrations. The nasal pungency and odor thresholds of the ketones decreased with increasing carbon chain length, but tended to plateau at 2-heptanone. The odor and pungency thresholds of the alcohols tended to increase when the hydroxy group was changed from a primary to a secondary carbon atom. The odor and pungency thresholds of the esters were similar. When plotted against the logarithm of the saturation vapor concentration, the logarithm of the pungency thresholds of the compounds conformed to a linear function that was approximately parallel to the saturation vapor concentration. No association between odor threshold and saturation vapor concentration was seen. The authors conclude that anosmics as well as normosmics can detect odors of volatile organic compounds, although at different concentrations. The pungency threshold data suggest that physical rather than chemical factors are involved in the interaction of volatile organic compounds with the nasal mucosa.

#### **Non-Human Toxicity Excerpts:**

>> /LABORATORY ANIMALS: Acute Exposure/ Exposure to a concentration of 10000 ppm for 5 hr caused irritation and death in guinea-pigs.

## **12. Ecological Information**

#### **ICSC Environmental Data:**

>> Environmental effects from the substance have not been investigated adequately.

## 13. Disposal Considerations

### Spillage Disposal

>> Remove all ignition sources. Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT wash away into sewer.

### Disposal Methods

>> SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational harm/injury/toxicity or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal and plant life; and conformance with environmental and public health regulations.

>> /Proposed methods of disposal should be used on statutory requirements of the state where disposal is to occur. The usual methods would be expected to include:/ 1) Absorbing in vermiculite, dry sand, earth or a similar material and disposing in a secured sanitary landfill. 2) Atomizing in a suitable combustion chamber.

>> 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

sec-Butyl acetate

3

UN Pack Group: II

Reportable Quantity of 5000 lb or 2270 kg

### IATA

sec-Butyl acetate

3,

UN Pack Group: II

## 15. Regulatory Information

### Clean Water Act Requirements:

The Clean Water Act (CWA) of 1972 establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under CWA, the U.S. Environmental Protection Agency (EPA) developed the Toxic Pollutant List (40 CFR Part 401.15) and the Priority Pollutant List (40 CFR Part 423, Appendix A). These lists are to be used by EPA and States to develop the Effluent Guidelines regulations and ensure water quality criteria and standards.

>> sec-Butyl acetate is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

### TSCA Requirements:

This section provides information on requirements concerning this chemical under the Toxic Substances Control Act (TSCA) of 1976. TSCA provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics and pesticides.

- >> Section 8(a) of TSCA requires manufacturers of this chemical substance to report preliminary assessment information concerned with production, exposure, and use to EPA as cited in the preamble in 51 FR 41329. Effective date 1/26/94; Reporting date: 3/28/94.

#### Regulatory Information

##### New Zealand EPA Inventory of Chemical Status

- >> Acetic acid, 1-methylpropyl ester: HSNO Approval: HSR001093 Approved with controls

## 16. Other Information

### Toxic Combustion Products:

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

- >> Toxic vapors and gases (such as carbon monoxide) may be released in a fire involving sec-butyl acetate.

"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."