SAFETY DATA SHEET

Updated on 20/07/2024

1. Material Identification

Product Name : sec-Butylamine
Catalog Number : io-1885
CAS Number : 13952-84-6
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

>> H225 (100%): Highly Flammable liquid and vapor [Danger Flammable liquids]

>> H301 (84.75%): Toxic if swallowed [Danger Acute toxicity, oral]

>> H302 (15.25%): Harmful if swallowed [Warning Acute toxicity, oral]

>> H314 (100%): Causes severe skin burns and eye damage [Danger Skin corrosion/irritation]

>> H332 (94.92%): Harmful if inhaled [Warning Acute toxicity, inhalation]

>> H400 (98.31%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (64.41%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P210, P233, P240, P241, P242, P243, P260, P261, P264, P270, P271, P273, P280, P301+P316, P301+P317, P301+P330+P331, P302+P361+P354, P303+P361+P353, P304+P340, P305+P354+P338, P316, P317, P321, P330, P363, P370+P378, P391, P403+P235, P405, and P501

NFPA 704 Diamond

NFPA Health Rating

>> 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

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:

>> Inhalation causes irritation or burns of the respiratory system; exposure to concentrated vapors can cause asphyxiation. Ingestion causes burns of mouth and stomach. Contact with eyes causes lachrymation, conjunctivitis, burns, corneal edema. Contact with skin causes irritation or burns, dermatitis. (USCG, 1999)

>> Special Hazards of Combustion Products: Toxic oxides of nitrogen may be formed in fire.

>> Behavior in Fire: Vapor is heavier than air and may travel to a source of ignition and flash back. Containers may explode in fire. (USCG, 1999)

>> Highly flammable. Vapour/air mixtures are explosive.

3. Composition/Information On Ingredients

Chemical name : sec-Butylamine
CAS Number : 13952-84-6
Molecular Formula : C4H11N
Molecular Weight : 73.1400 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. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

>> SKIN: IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. IMMEDIATELY call a hospital or poison control center even if no symptoms (such as redness or irritation) develop. IMMEDIATELY transport the victim to a hospital for treatment after washing the affected areas.

>> 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: DO NOT INDUCE VOMITING. Corrosive chemicals will destroy the membranes of the mouth, throat, and esophagus and volatile chemicals have a high risk of being aspirated into the victim's lungs during vomiting. Thus, the risk of increasing the medical problems by inducing vomiting of a volatile corrosive chemical is very high. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. IMMEDIATELY transport the victim to a hospital. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital. (NTP, 1992)

First Aid Measures

Inhalation First Aid

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

Skin First Aid

>> Remove contaminated clothes. Rinse skin with plenty of water or shower. 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.

Ingestion First Aid

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

5. Fire Fighting Measures

>> Vapor is heavier than air and may travel to a source of ignition and flash back.

>> Fire Extinguishing Agents Not to Be Used: Water may be ineffective.

>> Fire Extinguishing Agents: "Alcohol" foam, dry chemical, carbon dioxide (USCG, 1999)

>> Use water in large amounts, powder, alcohol-resistant foam, 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 153 [Substances - Toxic and/or Corrosive (Combustible)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> SPILL: Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> 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)

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: chemical protection suit including self-contained breathing apparatus. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

>> Fireproof. Separated from strong oxidants and strong acids. Cool. Dry. Keep in a well-ventilated room.

Storage Conditions:

>> Evacuate and restrict persons not wearing protective equipment from area of spill or leak until cleanup is complete. Remove all ignition sources. Establish forced ventilation to keep levels below explosive limit. Absorb liquids in vermiculite, dry sand, earth, peat, carbon, or a similar material and deposit in sealed containers. It may be necessary to contain and dispose of this chemical as a hazardous waste. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Contact your Department of Environmental Protection or your regional office of the federal EPA for specific recommendations. If employees are required to clean-up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable. /Butyl Amines/

8. Exposure Control/ Personal Protection

MAK (Maximale Arbeitsplatz Konzentration)

>> 6.1 mg/m

Inhalation Risk:

>> A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20 °C.

Effects of Short Term Exposure:

>> The substance is corrosive to the eyes, skin and respiratory tract.

Effects of Long Term Exposure:

>> Repeated or prolonged contact with skin may cause dermatitis.

Fire Prevention

>> NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting.

Exposure Prevention

>> STRICT HYGIENE! IN ALL CASES CONSULT A DOCTOR!

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Protective gloves. Protective clothing.

Eye Prevention

>> Wear safety spectacles, face shield or eye protection in combination with breathing protection.

Ingestion Prevention

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

Exposure Control and Personal Protection

Maximum Allowable Concentration (MAK)

>> 2.0 [ppm]

9. Physical And Chemical Properties

Molecular Weight:

>> 73.14

Exact Mass:

>> 73.089149355

Physical Description:

>> Sec-butylamine is a white liquid with an odor of ammonia. (USCG, 1999)

>> COLOURLESS LIQUID WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Colorless liquid

Odor:

>> Amine odor

Boiling Point:

>> 146.3 °F at 760 mmHg (NTP, 1992)

>> 63 °C

Melting Point:

>> -155 °F (NTP, 1992)

>> -104 °C

Flash Point:

>> 15 °F (NTP, 1992)

>> -9 °C c.c.

Solubility:

>> Soluble (>=10 mg/ml) (NTP, 1992)

>> Solubility in water: miscible

Density:

>> 0.721 at 68 °F (USCG, 1999) - Less dense than water; will float

>> Relative density (water = 1): 0.7

Vapor Density:

>> 2.52 (NTP, 1992) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 2.52

Vapor Pressure:

>> 315.37 mmHg (USCG, 1999)

>> Vapor pressure, kPa at 20 °C: 18

LogP:

>> log Kow = 0.74

>> 0.74

Stability/Shelf Life:

>> Stable

Autoignition Temperature:

>> 712 °F (USCG, 1999)

>> 378 °C

Decomposition:

>> When heated to decomposition it emits toxic fumes of nitroxides.

Corrosivity:

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

>> Corrosive to tin, aluminum, and some steels

Heat of Combustion:

>> -3008.6 kJ/mole @ 25 °C

Heat of Vaporization:

>> 32.85 kJ/mole at 25 °C

Surface Tension:

>> 22.42 dynes/cm= 0.02242 N/m @ 20 °C

Refractive Index:

>> Index of refraction: 1.394 at 20 °C/D

Dissociation Constants:

>> pKa = 10.56 (conjugate acid)

10. Stability And Reactivity

>> May be sensitive to air. (NTP, 1992). Water soluble.

11. Toxicological Information

Toxicity Summary:

>> IDENTIFICATION: sec-Butylamine is a colorless liquid with an ammoniacal odor. It is miscible with water and most organic solvents. Formulated products include phosphate and carbonate salts. Mixed solutions are not stable beyond three days and concentrates or mixed solutions require protection from direct ight or extremes in temperatures. sec-Butylamine is a fungicide particularly effective for the control of fruit rotting fungi. ANIMAL STUDIES: Groups of dogs were administered this compound as the carbonate or acetate salt and data were recorded for heart rate, respiration, blood pressure and EEG apparatus. IV administration of either the acetate or carbonate resulted in elevated blood pressure, heart rate and respiration. Intragastric administration of larger doses resulted in similar responses. Groups of rats 20 males and 20 females were utilized in a two litter generation, four generation. The Fo parents were allowed to bear six additional litters. The F1b, 2b and3b litters were used as parents for the following generation and maintained for varying periods (162-202 days after weaning their respective litters). Reproduction indices, fertility index, sestation index, viability index and lactation index were normal. A reduction of growth was noted throughout the study at the high dietary level. Reproduction was unimpaired for any of the eight litters produced by the Fo generation. Groups of rabbits were fed sec-butylamine phosphate in the diet and subjected to a two generation, one litter per generation reproduction study. Mortality of several animals was evident at the high dose. Animals switched from the high dose to a lower dose had no effect on fertility, duration of gestation, delivery of live progeny or lactation indices in both generations examined. Growth of the progeny in the F1 generation was normal, while it was slightly depressed in the F2. There was no effect of butylamine acetate noted on survival of offspring in either generation. Groups of Dutch Belted does (19 rabbits per group) were administered sec-butylamine daily from Day 8 through 18 of gestation. Mean fetal weights were lower than controls and a decreased viability of live fetuses was noted at the high dose level. There were no differences from controls with respect for reproduction, sex distribution of fetuses or the number of malformations found. Groups of 10 male and 10 female rats were fed sec-butylamine acetate in the diet for 3 months. At the high dose level a significant growth reduction was noted. A dose related leukopenia in both males and females was recorded. Gross and microscopic examination of tissues and organs showed no adverse effects of dietary sec-butylamine. Six male and six female rabbits were treated dermally for 20 days. A surfactant was present in the aqueous solution. The skin of half the animals was abraded prior to the initiation of the study. There was no mortality and only one animal of the abraded group showed adverse reactions (diarrhea) during the study. Growth, clinical chemistry, hematology and gross and microscopic examination of the tissues and organs were normal. The carcinogenic potential of sec-butylamine was judged to be low based on long term studies. In a feeding study using cows, residues of sec-butylamine were found in muscle, liver, fat and kidney. Data on the presence in urine and feces suggest it is easily absorbed in to the blood and excreted in the urine. Urinary samples from two dogs treated with sec-butylamine were acidified and distilled. A diphenylhydrazone was formed which corresponded to the product formed from a reaction with methyl ethyl ketone.[

Exposure Routes:

>> The substance can be absorbed into the body by inhalation of its vapour and by ingestion.

Inhalation Exposure

>> Cough. Laboured breathing. Sore throat. Shortness of breath.

Skin Exposure

>> Redness. Skin burns. Pain. Blisters.

Eye Exposure

>> Redness. Pain. Blurred vision. Severe deep burns.

Ingestion Exposure

>> Diarrhoea. Sore throat. Vomiting. Abdominal pain. Burning sensation. Shock or collapse.

Adverse Effects:

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

>> Dermatotoxin - Skin burns.

>> Toxic Pneumonitis - Inflammation of the lungs induced by inhalation of metal fumes or toxic gases and vapors.

Antidote and Emergency Treatment:

>> Basic treatment: Establish a patent airway (oropharyngeal or nasopharyngeal airway, if needed). Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for pulmonary edema and treat if necessary ... . Monitor for shock and treat if necessary ... . Anticipate seizures and treat if necessary ... . For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with 0.9% saline (NS) during transport ... . Do not use emetics. For ingestion, rinse mouth and administer 5 mg/kg up to 200 ml of water for dilution if the patent can swallow, has a strong gag reflex, and does not

drool. Administer activated charcoal ... . Cover skin burns with dry sterile dressings after decontamination ... . /Organic bases/Amines and related compounds/

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ Inhalation causes irritation or burns of the respiratory system; Exposure to concentrated vapors can cause asphyxiation. Ingestion causes burns of mouth and stomach. Contact with eyes causes lacrimation, conjunctivitis, burns, corneal edema. Contact with skin causes irritation or burns, dermatitis.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ It is a severe dermal irritant although the dermal LD50 in rabbits is 2500 mg/kg.

Non-Human Toxicity Values:

>> LD50 Hen oral 250 mg/kg

Populations at Special Risk:

>> ... Employees /with chronic respiratory, skin, or eye disease are/ at increased risk from butylamine exposure. /n-Butylamine/

12. Ecological Information

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: A sediment core sample collected from Chesapeake Bay, MD in June 1988, from a depth of 10-15 cm, had a sec-butylamine concentration of 0.05 uM(1).

13. Disposal Considerations

Spillage Disposal

>> Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Disposal Methods

>> SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational exposure 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, aquatic, and plant life; and conformance with environmental and public health regulations.

>> Controlled incineration; incinerator is equipped with a scrubber or thermal unit to reduce NOx emissions. /Butyl Amines/

>> /Absorb small spills with paper and/ burn the paper in a suitable location away from combustible materials. Large quantities can be reclaimed or collected & atomized in suitable combustion chamber equipped with appropriate effluent gas cleaning device. /N-BUTYLAMINE/

14. Transport Information

DOT

sec-Butylamine
3
UN Pack Group: II
Reportable Quantity of 1000 lb or 454 kg

IATA

sec-Butylamine
3, 6.1

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-Butylamine 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.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: 2-Butanamine

REACH Registered Substance

>> Status: Active Update: 19-04-2023 https://echa.europa.eu/registration-dossier/-/registered-dossier/24799

>> Status: No longer Valid Update: 11-05-2018 https://echa.europa.eu/registration-dossier/-/registered-dossier/24835

New Zealand EPA Inventory of Chemical Status

>> s-Butylamine: Does not have an individual approval but may be used under an appropriate group standard

16. Other Information

Toxic Combustion Products:

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

>> Toxic oxides of nitrogen may be formed in a fire.

Other Safety Information

Chemical Assessment

>> Evaluation - Chemicals that are unlikely to require further regulation to manage risks to environment

"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."