Chemical Safety Data Sheet MSDS / SDS

Butyronitrile SDS

Revision Date:2024-04-25 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name: Butyronitrile

CAS: 109-74-0

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

Telephone: +91 9550333722

SECTION 2: Hazards identification

Classification of the substance or mixture

Flammable liquids, Category 2
Acute toxicity - Category 3, Oral

Acute toxicity - Category 3, Dermal
Acute toxicity - Category 3, Inhalation

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour
H301 Toxic if swallowed
H311 Toxic in contact with skin
H331 Toxic if inhaled

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.

Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].
P370+P378 In case of fire: Use ... to extinguish.
P301+P316 IF SWALLOWED: Get emergency medical help immediately.
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P316 Get emergency medical help immediately.

P361+P364 Take off immediately all contaminated clothing and wash it before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Storage

P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Butyronitrile
Common names and synonyms:	Butyronitrile
CAS number:	109-74-0
EC number:	203-700-6
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer for medical attention. See Notes.

Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention .

Following eye contact

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

Following ingestion

Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Give a slurry of activated charcoal in water to drink. Refer for medical attention . See Notes.

Most important symptoms/effects, acute and delayed

Dizziness, rapid respirations, headache, drowsiness, drop in blood pressure and pulse, delayed symptoms. May cause cyanosis (blue-grey coloring of skin and lips due to lack of oxygen) (USCG, 1999)

Indication of immediate medical attention and special treatment needed, if necessary

First-aid & medical therapy should be the same as for hydrogen cyanide.

SECTION 5: Firefighting measures

Suitable extinguishing media

Alcohol foam.

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic cyanide fumes (USCG, 1999)

Special protective actions for fire-fighters

Use water spray, foam, alcohol-resistant foam, dry powder, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

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. Do NOT let this chemical enter the environment.

Personal protection: self-contained breathing apparatus.

Environmental precautions

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. Do NOT let this chemical enter the environment. Personal protection: self-contained breathing apparatus.

Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. NO contact with oxidizing agents. Above 17°C use a closed system, ventilation and explosion-proof electrical equipment. Do NOT use compressed air for filling, discharging, or handling. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants, strong reducing agents, strong bases, strong acids and food and feedstuffs. Keep in a well-ventilated room.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	Butyronitrile			
CAS No.	109-74-0			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m^3	ppm	mg/m^3
USA - NIOSH	8	22	?	?
	Remarks			

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

Skin protection

Protective clothing. Protective gloves.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Butyronitrile is a clear colorless liquid. Flash point 76°F. Less dense than water. Vapors heavier than air. Produces toxic oxides of nitrogen during combustion. Used in the manufacture of other chemicals.
Colour:	Colorless liquid
Odour:	Sharp, suffocating odor.
Melting point/freezing point:	263°C(lit.)

Boiling point or initial boiling point and boiling range:	110°C/64mmHg(lit.)
Flammability:	Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Lower and upper explosion limit/flammability limit:	LOWER FLAMMABLE LIMIT: 1.65%
Flash point:	17°C(lit.)
Auto-ignition temperature:	910° F (USCG, 1999)
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	0.8 cPs @ 0 deg C; 0.6 cPs @ 20 deg C; 0.5 cPs @ 40 deg C
Solubility:	3 % at 77° F (NIOSH, 2016)
Partition coefficient n-octanol/water:	log Kow = 0.53
Vapour pressure:	23 mm Hg (25 °C)
Density and/or relative density:	0.79
Relative vapour density:	2.4 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes on burning. Decomposes on contact with hot surfaces, flames or acids. This produces toxic and corrosive fumes

including hydrogen cyanide and nitrogen oxides. Reacts violently with strong acids, strong bases, strong oxidants and strong reducing agents.

Chemical stability

no data available

Possibility of hazardous reactions

FLAMMABLE, DANGEROUS FIRE RISK.The vapour mixes well with air, explosive mixtures are easily formed.BUTYRONITRILE can react vigorously with oxidizing reagents, when heated to decomposition, it emits highly toxic fumes of cyanides and oxides of nitrogen [Sax, 9th ed., 1996, p. 609]. Nitriles may polymerize in the presence of metals and some metal compounds. They are incompatible with acids; mixing nitriles with strong oxidizing acids can lead to extremely violent reactions. Nitriles are generally incompatible with other oxidizing agents such as peroxides and epoxides. The combination of bases and nitriles can produce hydrogen cyanide. Nitriles are hydrolyzed in both aqueous acid and base to give carboxylic acids (or salts of carboxylic acids). These reactions generate heat. Peroxides convert nitriles to amides. Nitriles can react vigorously with reducing agents. Acetonitrile and propionitrile are soluble in water, but nitriles higher than propionitrile have low aqueous solubility. They are also insoluble in aqueous acids.

Conditions to avoid

no data available

Incompatible materials

Strong oxidizers & reducing agents, strong acids & bases.

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of NOx and CN- /nitrogen oxides and cyanides/.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Rat oral 135 mg/kg

Inhalation: LC50 Mouse inhalation 249 ppm/1 hr

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The vapour is mildly irritating to the eyes, skin and respiratory tract. The substance may cause effects on the cellular respiration (inhibition). This may result in convulsions, cardiac disorders and respiratory failure. Exposure at high levels could cause death. The effects may be delayed. Medical observation is indicated.

STOT-repeated exposure

no data available

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C , on spraying or dispersing much faster.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

AEROBIC: Enzyme-catalyzed hydrolysis of nitriles has been shown to proceed by two distinct routes(1,2); a nitrilase transforms the nitriles directly into acids plus ammonium ion, or a nitrile hydratase forms the amide which is hydrolyzed to acid plus ammonium ion by amidase(1,2). A predictive method based upon evaluated biodegradation data and the fact that butanenitrile contains a nitrile substructure predicts that butanenitrile has a high probability of biodegrading fast in the environment(3). A mixed microbial culture, isolated from an environment contaminated with organic cyanides and PCBs, utilized butanenitrile as the sole source of carbon and nitrogen(4). The mixed microbial culture was grown for 48 hrs at pH 7 with 1 g/l of butanenitrile; the final pH and ammonia concn were determined to be 8.69 and 74.6 umol/ml, respectively(4). Isobutanenitrile, a chemical whose structure is similar to butanenitrile, has been shown to biodegrade readily using the Japanese MITI protocol (2 wk incubation, 100 ppm concn) with theoretical BODs of 53.9-66.3%(5,6). In addition, acetonitrile, which is structurally similar to butanenitrile, has been shown to biodegrade readily in river water, especially with acclimated microbes(7,8). Thus, butanenitrile may be expected to biodegrade in the environment(SRC).

Bioaccumulative potential

An estimated BCF of 3 was calculated for butanenitrile(SRC), using a log Kow of 0.53(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

Mobility in soil

The Koc of butanenitrile is estimated as 46(SRC), using a measured log Kow of 0.53(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that butanenitrile is expected to have very high mobility in soil(SRC).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN2411 (For reference only, please check.)
IMDG: UN2411 (For reference only, please check.)
IATA: UN2411 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: BUTYRONITRILE (For reference only, please check.)
IMDG: BUTYRONITRILE (For reference only, please check.)
IATA: BUTYRONITRILE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.)
IMDG: 3 (For reference only, please check.)
IATA: 3 (For reference only, please check.)

Packing group, if applicable

ADR/RID: II (For reference only, please check.)
IMDG: II (For reference only, please check.)
IATA: II (For reference only, please check.)

Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available.Depending on the degree of exposure, periodic medical examination is suggested.