

Chemical Safety Data Sheet MSDS / SDS

Butan-1-ol SDS

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

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

Product name: Butan-1-ol

CAS: 71-36-3

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 3

Acute toxicity - Category 4, Oral

Skin irritation, Category 2
Serious eye damage, Category 1
Specific target organ toxicity - single exposure, Category 3
Specific target organ toxicity - single exposure, Category 3

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H226 Flammable liquid and vapour
H302 Harmful if swallowed
H315 Causes skin irritation
H318 Causes serious eye damage
H335 May cause respiratory irritation
H336 May cause drowsiness or dizziness

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+P317 IF SWALLOWED: Get medical help.

P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P321 Specific treatment (see ... on this label).
P332+P317 If skin irritation occurs: Get medical help.
P362+P364 Take off contaminated clothing and wash it before reuse.
P305+P354+P338 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P317 Get medical help.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P319 Get medical help if you feel unwell.

Storage

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

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:	Butan-1-ol
Common names and synonyms:	Butan-1-ol
CAS number:	71-36-3
EC number:	200-751-6
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest.

Following skin contact

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

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. Give one or two glasses of water to drink. Do NOT induce vomiting. Refer for medical attention .

Most important symptoms/effects, acute and delayed

Anesthesia, nausea, headache, dizziness, irritation of respiratory passages. Mildly irritating to the skin and eyes. (USCG, 1999)

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

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. Higher alcohols (>3 carbons) and related compounds

SECTION 5: Firefighting measures

Suitable extinguishing media

Special hazards arising from the substance or mixture: carbon oxides...

Specific hazards arising from the chemical

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 ground and collect in low or confined areas (sewers, basements, tanks). 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 are lighter than water. (ERG, 2016)

Special protective actions for fire-fighters

Use water spray, powder, foam, 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

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. 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. Wash away remainder with plenty of water.

Environmental precautions

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. 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. Wash away remainder with plenty of water.

Methods and materials for containment and cleaning up

ACCIDENTAL RELEASE MEASURES. Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.; Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains.; Methods and materials for containment and cleaning up: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Above 29°C use a closed system, ventilation and explosion-proof electrical equipment. 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 and aluminium.

SECTION 8: Exposure controls/personal protection**Control parameters****Occupational Exposure limit values**

TLV: 20 ppm as TWA.MAK: 310 mg/m³, 100 ppm; peak limitation category: I(1); pregnancy risk group: C

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 safety goggles.

Skin protection

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: Liquid. Liquid.

Colour:	Colourless, clear.
Odour:	HARSH FUSEL ODOR WITH BANANA
Melting point/freezing point:	< -90 °C. Remarks:Endpoint of instrument reached, no final result.
Boiling point or initial boiling point and boiling range:	119 °C. Atm. press.:1 013 hPa.
Flammability:	Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.
Lower and upper explosion limit/flammability limit:	Lower flammable limit: 1.4% by volume; Upper flammable limit: 11.2% by volume
Flash point:	35 °C. Atm. press.:1 013 hPa.
Auto-ignition temperature:	355 °C. Atm. press.:1 019 hPa.
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	dynamic viscosity (in mPa s) = 2.947. Temperature:20°C.
Solubility:	Miscible with water
Partition coefficient n-octanol/water:	Pow = 10. Temperature:25 °C.;log Pow = 1. Temperature:25 °C.
Vapour pressure:	< 10 hPa. Temperature:20 °C. Remarks:Extrapolated result based on experimental result.
Density and/or relative density:	809.5 kg/m ³ . Temperature:20 °C.
Relative vapour density:	2.55 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

1400 ppm [Based on 10% of the lower explosion limit for safety considerations even though the relevant toxicological data indicated irreversible health effects or impairment of escape existed only at higher concentrations.]

Reacts with aluminium when heated to 100°C and strong oxidants such as chromium trioxide. This produces flammable/explosive gas (hydrogen - see ICSC 0001). Attacks some forms of plastic, rubber and coatings.

Chemical stability

no data available

Possibility of hazardous reactions

Flammable liquid. Moderately explosive when exposed to flame. N-BUTYL ALCOHOL attacks plastics. [Handling Chemicals Safely 1980. p. 236]. Mixtures with concentrated sulfuric acid and strong hydrogen peroxide can cause explosions. May form explosive butyl hypochlorite by reacting with hypochlorous acid. May form butyl explosive butyl hypochlorite with chlorine.

Conditions to avoid

no data available

Incompatible materials

Butanol, used as a solvent in an autoclave preparation at 100 deg C, severely attacked the aluminum gasket, liberating hydrogen which caused a sharp rise in pressure. Other alcohols would behave similarly .

Hazardous decomposition products

When heated to decomp it emits acrid smoke and fumes.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 - rat (female) - ca. 2 292 mg/kg bw. Remarks:Converted value (calculated with a density 0.81 g/mL).

Inhalation: LC0 - rat (male/female) - > 17.76 mg/L air (analytical).

Dermal: LD50 - rabbit (male) - ca. 3 430 mg/kg bw.

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

CLASSIFICATION: D; not classifiable as to human carcinogenicity. BASIS FOR CLASSIFICATION: Based on no human and no animal cancer data. HUMAN CARCINOGENICITY DATA: None. ANIMAL CARCINOGENICITY DATA: None.

Reproductive toxicity

no data available

STOT-single exposure

The substance is severely irritating to the eyes. The substance is irritating to the skin. The vapour is irritating to the eyes and respiratory tract. Exposure far above the OEL could cause lowering of consciousness. If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

STOT-repeated exposure

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

Aspiration hazard

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

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - *Pimephales promelas* - 1 376 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - *Daphnia magna* - 1 328 mg/L - 48 h.

Toxicity to algae: EC50 - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 225 mg/L - 96 h.

Toxicity to microorganisms: EC90 - *Pseudomonas putida* - 8 690 mg/L - 17 h.

Persistence and degradability

AEROBIC: n-Butyl alcohol biodegrades rapidly in screening tests using a sewage or activated sludge inoculum and is considered readily biodegradable(1). n-Butyl alcohol reached 66% of its theoretical BOD in a sewage sludge during a 5 day incubation period(2) and 33% of its theoretical BOD using an inoculum from polluted surface water(3). The first-order rate constant for the degradation of n-butyl alcohol in soils was reported as $2 \times 10^{-6} \text{ sec}^{-1}$ (4); this corresponds to a half-life of approximately 4 days(SRC). The first-order biodegradation rate constant of n-butyl alcohol in an activated sludge inoculum was reported as 9.59×10^{-3} per hour(5); this corresponds to a half-life of about 3 days(SRC). The biodegradation half-life of n-butyl alcohol in a sub-surface soil from Blacksburg, VA was approximately 7 days(6). The biodegradation half-life of n-butyl alcohol in a basic sandy silt loam from Texas was reported as 1 day and the half-life of n-butyl alcohol in an acidic sandy loam from Mississippi was reported as 8.5 days(7). A 20 day BOD (Biochemical Oxygen Demand) test was conducted using unacclimated settled domestic wastewater as the microbial seed (3 mL/BOD bottle)(1); the results showed a BOD5 of 68% ThOD (percent of theoretical oxygen demand), a BOD10 of 87% ThOD, a BOD15 of 92% ThOD, and a BOD20 of 92% ThOD(1). n-Butyl alcohol, present at 100 mg/L, reached >60% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(8).

Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for n-butyl alcohol(SRC), using a log Kow of 0.88(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 measured Koc of n-butyl alcohol is reported as 3.2(1). According to a classification scheme(2), this Koc value suggests that n-butyl alcohol 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: UN1120 (For reference only, please check.)

IMDG: UN1120 (For reference only, please check.)

IATA: UN1120 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: BUTANOLS (For reference only, please check.)

IMDG: BUTANOLS (For reference only, please check.)

IATA: BUTANOLS (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/>

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