N-BUTANOL
Safety Data Sheet

Supersedes: 20/02/2023 Revision: 1.3 Revision date: 12/12/2023

SECTION 1: Identification

1.1 Identification

Product form	:	Substance
Substance name	:	n-Butanol
CAS No	:	71-36-3
EC/ List No	:	200-751-6
Formula	:	$C_4H_{10}O$
Molecular weight	:	74.12 g/mol
Synonyms	:	Butyl Alcohol, Butyl alcohol

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

Use of the substance/mixture	:	Laboratory chemicals, Manufacture of substances
Relevant identified uses	:	Industrial uses
Uses advised against:	:	Not known

1.3 Details of the supplier of the safety data sheet

Godavari Biorefineries Ltd.
45/47, Somaiya bhavan,
Mahatma Gandhi Road,
Fort, Mumbai -400001, INDIA.
T 0091 22 22048272
Email: alka@somaiya.com
www.somaiya.com

1.4 Emergency telephone Number

Emergency number	:	0091 2423 279308 0091 22 22048272 (Monday – Friday - 09.30 hrs to 18.00 hrs)

SECTION 2: Hazard(s) identification

GHS classification

2.1 Classification of the substance or mixture

Flammable liquids (Category 3), H226
Acute toxicity, Oral (Category 4), H302
Skin irritation (Category 2), H315
Serious eye damage (Category 1), H318
Specific target organ toxicity - single exposure (Category 3), Respiratory system, Central nervous system, H335, H336
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS labeling

Hazard pictograms (GHS) :

GHS-02 GHS-05 GHS-07

Signal word (GHS) : Danger

Hazard statements (GHS) :

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

Precautionary statements (GHS)

P210	:	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	:	Keep container tightly closed.

P280	:	Wear protective gloves/ protective clothing/ eye protection/ face protection /hearing protection.
P242	:	Use non-sparking tools.
P301+P312	:	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P303+P361+P353	:	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P305+P351+P338	:	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P403+P235	:	Store in a well-ventilated place. Keep cool.
P501	:	Dispose of contents/ container to an approved waste disposal plant.
Supplemental Hazard information:	:	None

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

2.4 Unknown acute toxicity (GHS US)

Not applicable.

SECTION 3: Composition/Information on ingredients

3.1 Substance

Name	Product Identifier CAS-No. EC-No. Index No.	Concentration %	GHS Classification
1-Butanol	71-36-3 200-751-6 603-004-00-6	≥99	Flam. Liq. 3; Acute Tox. 4; Skin Irrit. 2; Eye Dam. 1; STOT SE 3; H226, H302, H315, H318, H336, H335 Concentration limits: >= 20 %: STOT SE 3, H335; >= 20 %: STOT SE 3, H336;

Full text of hazard classes and H-statements: see section 16

3.2 Mixture

Not applicable.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information	:	Consult a physician. Show this safety data sheet to the doctor in attendance. Take copy of label and MSDS to health professional with contaminated individual.
Inhalation	:	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
Skin contact	:	In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.
Eye contact	:	After eye contact: rinse out with plenty of water at least 15 min. Immediately call in ophthalmologist. Remove contact lenses if possible.
Ingestion	:	Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Carbon dioxide (CO2) Foam Dry powder
Unsuitable extinguishing media	:	For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products	:	Carbon oxides Flash back possible over considerable distance. Combustible. Vapors are heavier than air and may spread along floors. Forms explosive mixtures with air at elevated temperatures. Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters

Firefighting instructions	:	Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Additional information

In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains. Risk of explosion.

6.3 Methods and material for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For personal protection see section 8, For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice for safe handling	:	Avoid generation of vapours/aerosols.
Advice on protection against fire and explosion	:	Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.
Hygiene measures	:	Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Handle and store under inert gas. Hygroscopic

7.3 Specific end uses

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Component	ACGIH	OSHA PEL	NIOSH REL	Mexico OEL (TWA)
n-Butanol	20 ppm TWA (8 h)	50 ppm C	50 ppm C	--
		100 ppm TWA (8 h)		

8.2 Exposure controls

8.2.1 Appropriate engineering controls : Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment :

Protective goggles. Gloves. Protective clothing. Face shield. Gas mask with filter.

Eye/face protection : Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles.

Skin protection:
Hand protection : This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact Material: Nitrile rubber
Minimum layer thickness: 0,4 mm
Break through time: 480 min
Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact Material: Chloroprene
Minimum layer thickness: 0,65 mm
Break through time: 120 min
Material tested: KCL 720 Camapren®

Body protection: : Flame retardant antistatic protective clothing.

Respiratory protection : Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds
The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer.
These measures have to be properly documented.

Environmental exposure controls : Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	Liquid
Appearance	:	Clear, Liquid
Colour	:	Colourless
Odour	:	Ethanolic
pH	:	7 at 70 g/l at 20 °C
Melting point	:	-90 °C

Freezing point	:	No Data Available
Initial boiling point/boiling range	:	116 - 118 °C
Flash Point	:	35 °C – closed cup
Relative evaporation rate	:	No Data Available
Relative density	:	No Data Available
Relative vapour density at 20°C	:	2.56 at 20 °C - (Air = 1.0)
Specific gravity/ density	:	0.805 – 0.813 at 20 °C
Molecular mass	:	74.12 g/mol
Flammability(Solid, Gas)	:	No data available
Upper/lower flammability or Explosive limit	:	Upper explosion limit: 11.2 %(V) Lower explosion limit: 1.4 %(V)
Solubility	:	66 g/l at 20 °C - OECD Test Guideline 105
Vapor pressure	:	< 10 hPa @ 20^0C
Evaporation Rate	:	No Data Available
Partition coefficient n-octanol/water	:	Log Pow1.0 at 20^0C
Auto-ignition temperature	:	No Data Available
Decomposition temperature	:	No Data Available
Viscosity	:	2.95 mPa.s at 20 °C(Dynamic Viscosity)
Explosive Limits	:	No Data Available
Oxidizing properties	:	No Data Available

9.2 Other information

Surface tension	:	69.9 mN/m at 1g/l at 20 °C - OECD Test Guideline 115

SECTION 10: Stability and reactivity

10.1 Reactivity	:	Vapor/air-mixtures are explosive at intense warming.
10.2 Chemical Stability	:	The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure
10.3 Possibility of hazardous reactions	:	Risk of ignition or formation of inflammable gases or vapours with: strong oxidising agents chromium(VI) oxide Exothermic reaction with: Alkali metals Alkaline earth metals Aluminum strong reducing agents Acid chlorides
10.4 Conditions to avoid	:	Exposure to moisture. Heating.
10.5 Incompatible materials	:	Strong oxidizing agents.
10.6 Hazardous decomposition products	:	In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity LD50	:	Species: Rat Value: >790 mg/kg
Acute dermal toxicity LD50	:	LD50 Oral - Rat - 790 mg/kg Remarks: Liver: Fatty liver degeneration. Kidney, Ureter, Bladder: Other changes. Blood: Other changes. (RTECS) LD50 Dermal - Rabbit - male - 3430 mg/kg bw (OECD Test Guideline 402)

Skin corrosion/irritation	:	Skin - Rabbit Result: Skin irritation - 2 h Remarks: (ECHA) (Regulation (EC) No 1272/2008, Annex VI)
Eye irritation	:	Eyes - Rabbit Result: Irreversible effects on the eye (OECD Test Guideline 405) (Regulation (EC) No 1272/2008, Annex VI)
Respiratory or skin sensitization	:	No data available
Germ cell mutagenicity	:	Mutagenicity (mammal cell test): micronucleus. Chinese hamster lung cells Result: negative Remarks:(ECHA)
Carcinogenicity	:	IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
Teratogenicity	:	No data available
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	May cause respiratory irritation. May cause drowsiness or dizziness.
Specific target organ toxicity (repeated exposure)	:	May cause respiratory irritation. May cause drowsiness or dizziness.
Aspiration hazard	:	No data available

Additional Information

RTECS: EO1400000

drying, cracking of the skin, Skin irritation To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to Fish LC50	:	Species: Pimephales promelas, Value: 1376 mg/l Exposure time: 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates EC50	:	static test EC50 - Daphnia magna (Water flea) - 1328 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	:	static test ErC50 - Pseudokirchneriella subcapitata (green algae) -225 mg/l - 96 (OECD Test Guideline 201)
Toxicity to bacteria	:	static test EC50 - Pseudomonas putida - 4390 mg/l - 17 h (DIN 38421 TEIL 8)

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 20 d Result: 92 % - Readily biodegradable.
Remarks: (ECHA)
Ratio BOD/ThBOD 33 %
Remarks: (IUCLID)

12.3 Bio accumulative potential

Bioaccumulation Oncorhynchus mykiss (rainbow trout) - 24 h - 921 mg/l(n-butanol)
Bioconcentration factor (BCF): 0,38

12.4 Mobility in soil

No Data Available.

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No Data Available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product disposal : Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dispose of in accordance with all applicable local and national regulations.

Packaging: : Dispose of as unused product.

SECTION 14: Transport Information

14.1 UN number	ADR/RID: 1120	IMDG: 1120	IATA: 1120
14.2 UN proper shipping name	ADR/RID: BUTANOLS	IMDG: BUTANOLS	IATA: Butanols
14.3 Transport hazard class(es)	ADR/RID: 3	IMDG: 3	IATA: 3
14.4 Packaging group	ADR/RID: III	IMDG: III	IATA: III
14.5 Environmental hazards	ADR/RID: no	IMDG Marine pollutant: no	IATA: no
14.6 Special precautions for user	No data available		

SECTION 15: Regulatory information

15.1 National regulations

Country	National Inventories	Listing
AUSTRALIA	AICS	Listed
CANADA	DSL	Listed
CHINA	IECSC	Listed
EUROPE	EC	Listed
JAPAN	ENCS	Listed
NEWZEALAND	NZIoC	Listed
PHILIPPINES	PICCS	Listed
SOUTH KOREA	KECI	Listed
TAIWAN	TCSI	Listed
USA	TSCA	Listed

SECTION 16: Other information

16.1 Hazard Statement

H226 : Flammable liquid and vapor.

H302 : Harmful if swallowed.

H315 : Causes skin irritation.

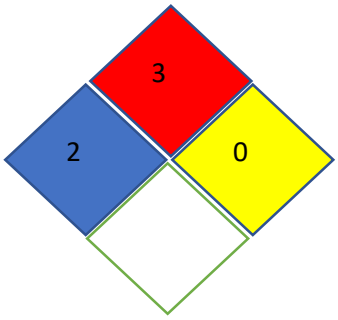
H318 : Causes serious eye damage

H335 : May cause respiratory irritation.

H336 : May cause drowsiness or dizz

16.2 NFPA Rating

:



16.3 Abbreviations and acronyms

:

PBT =Persistent Bioaccumulative and Toxic
vPvB= Very Persistent and Very Bioaccumulative
SCBA= Self Contained Breathing Apparatus
NIOSH REL= National Institute for Occupational Safety and Health Recommended Exposure Limit
OSHA PEL=Occupational Safety and Health Adminstration Permissible Exposure Limit
OELTWA= Occupational Exposure Limit Time Weighted Averages
IDLH= Immediately Dangerous to Life or Health
UEL= Upper Explosive Limit
LEL= Lower Explosive Limit
RTECS= Registry of Toxic Effects of Chemical Substances
NTP=National Toxicology Programm
IARC= International Agency for Research on Cancer
EPA=Environmental Protection Agency
TSCA= Toxic Substances Control Act
NFPA= National Fire Protection Association
CSR=Chemical Safety Report
BCF = Bio Concentration Factor
DNEL = Derived No Effect Level
PNEC = Predicted No Effect Concentration
TLV = Threshhold Limit Value
ACGIH = American Conference of Governmental Industrial Hygienist
REACH = Registration, Evaluation .Authorisation and Restriction of Chemicals
CLP = Classification, Labelling and Packaging
LD / LC = Lethal Doses / Lethal Concentration
GHS = Globally Harmonised System
ADR = Accord europeen relative au transport international de marchandises
IMDG-Code = International Maritime Code for Dangerous Goods
EmS = Emergency measures on Sea
ICAO = International Civil Aviation Organization
IATA/DGR= International Air Transport Association/Dangerous Goods Regulation

16.4 Further information:

Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is Made and Godavari Biorefineries Ltd. assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for his application.