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

1.1 Product identifier

Trade name: butan-1-ol

Article number: 0220

CAS Number:
71-36-3

EC number:
200-751-6

Index number:
603-004-00-6

Registration number: 01-2119484630-38-XXXX

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

Only for the use of professionals users

Life cycle stages IS Use at industrial Sites

Sector of Use
SU9 Manufacture of fine chemicals
SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU24 Scientific research and development

Product category
PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents
PC21 Laboratory chemicals
PC29 Pharmaceuticals
PC40 Extraction agents

Process category
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4 Chemical production where opportunity for exposure arises
PROC5 Mixing or blending in batch processes
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC15 Use as laboratory reagent

Environmental release category
ERC1 Manufacture of the substance
ERC2 Formulation into mixture
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC6a Use of intermediate

Application of the substance / the mixture
Chemical for research, development, manufacturing, laboratory chemical for analysis.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:
Biosolve Chimie
20 Rue Roger Husson, 57260 Dieuze, France
Tel: +33 3 878 675 80/81/82/83/84/85
Email: info@biosolvechimie.com

Biosolve B.V.
Leenderweg 78, 5555 CE Valkenswaard, the Netherlands.
Tel: +31-(0)40-2071300
Fax: +31-(0)40-2048537
Email: info@biosolve-chemicals.com

(Contd. on page 2)
SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008

- GHS02 flame
  Flam. Liq. 3 H226 Flammable liquid and vapour.
- GHS05 corrosion
  Eye Dam. 1 H318 Causes serious eye damage.
- GHS07
  Acute Tox. 4 H302 Harmful if swallowed.
  Skin Irrit. 2 H315 Causes skin irritation.
  STOT SE 3 H335-H336 May cause respiratory irritation. May cause drowsiness or dizziness.

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008
The substance is classified and labelled according to the CLP regulation.

- Hazard pictograms
  GHS02 GHS05 GHS07

- Signal word Danger
- Hazard statements
  H226 Flammable liquid and vapour.
  H302 Harmful if swallowed.
  H315 Causes skin irritation.
  H318 Causes serious eye damage.
  H335-H336 May cause respiratory irritation. May cause drowsiness or dizziness.

- Precautionary statements
  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.
  P310 Immediately call a POISON CENTER/doctor.
  P330 Rinse mouth.
SECTION 3: Composition/information on ingredients

3.1 Chemical characterisation: Substances
- CAS No. Description
  71-36-3 butan-1-ol
- Identification number(s)
  - EC number: 200-751-6
  - Index number: 603-004-00-6

SECTION 4: First aid measures

4.1 Description of first aid measures
- General information:
  Immediately remove any clothing soiled by the product. Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- After inhalation: In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Call for a doctor immediately.

4.2 Most important symptoms and effects, both acute and delayed
No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed
No further relevant information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media
- Suitable extinguishing agents:
  CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- For safety reasons unsuitable extinguishing agents: Water with full jet

5.2 Special hazards arising from the substance or mixture
No further relevant information available.

5.3 Advice for firefighters
- Protective equipment: No special measures required.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.

6.2 Environmental precautions: Do not allow to enter sewers/ surface or ground water.
Trade name: butan-1-ol

6.3 Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralising agent.
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.

6.4 Reference to other sections
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Avoid contact with skin and eyes.
Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking.
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.

Information about fire - and explosion protection:
Keepign sources away - Do not smoke.
Protect against electrostatic charges.

7.2 Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: Keep container tightly sealed.

7.3 Specific end use(s) No further relevant information available.

SECTION 8: Exposure controls/personal protection

Additional information about design of technical facilities: No further data; see item 7.

8.1 Control parameters
Ingredients with limit values that require monitoring at the workplace: Not required.
Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls
Personal protective equipment:
General protective and hygienic measures:
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the skin.
Avoid contact with the eyes and skin.

Respiratory protection:
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
Trade name: butan-1-ol

- Protection of hands:

  Protective gloves

  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- Material of gloves

  The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

- Penetration time of glove material

  The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- Eye protection:

  Tightly sealed goggles

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**SECTION 9: Physical and chemical properties**

- 9.1 Information on basic physical and chemical properties

  General Information

  - Appearance:
    - Form: Fluid
    - Colour: Colourless
    - Odour: Alcohol-like
    - Odour threshold: Not determined.

  - pH-value: 7

  - Change in condition
    - Melting point/freezing point: -89 °C
    - Initial boiling point and boiling range: 116-118 °C

  - Flash point: 35 °C

  - Flammability (solid, gas): Not applicable.

  - Ignition temperature: 340 °C

  - Decomposition temperature: Not determined.

  - Auto-ignition temperature: Not determined.

  - Explosive properties: Product is not explosive. However, formation of explosive air/ vapour mixtures are possible.

  - Explosion limits:
    - Lower: 1.5 Vol %
    - Upper: 9.4 Vol %

  (Contd. on page 6)
Trade name: butan-1-ol

- Vapour pressure at 20 °C: 6.7 hPa
- Density at 20 °C: 0.81 g/cm³
- Relative density: Not determined.
- Vapour density: Not determined.
- Evaporation rate: Not determined.
- Solubility in / Miscibility with water at 20 °C: 77 g/l
- Partition coefficient: n-octanol/water: Not determined.
- Viscosity:
  - Dynamic at 20 °C: 2.95 mPas
  - Kinematic: Not determined.
- 9.2 Other information No further relevant information available.

SECTION 10: Stability and reactivity

- 10.1 Reactivity No further relevant information available.
- 10.2 Chemical stability
  - Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- 10.3 Possibility of hazardous reactions: No dangerous reactions known.
- 10.4 Conditions to avoid: No further relevant information available.
- 10.5 Incompatible materials: No further relevant information available.
- 10.6 Hazardous decomposition products: No dangerous decomposition products known.

SECTION 11: Toxicological information

- 11.1 Information on toxicological effects
  - Acute toxicity
    - Harmful if swallowed.
  - LD/LC50 values relevant for classification:
    | Route   | LD50/C50/4 h | Value (mg/kg) |
    |---------|-------------|---------------|
    | Oral    | LD50        | 790           |
    | Dermal  | LD50        | 3,400         |
    | Inhalative | LC50/4 h | 8,000         |
  - Primary irritant effect:
    - Skin corrosion/irritation
      - Causes skin irritation.
  - Serious eye damage/irritation
    - Causes serious eye damage.
  - Respiratory or skin sensitisation: Based on available data, the classification criteria are not met.
  - CMR effects: (carcinogenicity, mutagenicity and toxicity for reproduction)
    - Germ cell mutagenicity: Based on available data, the classification criteria are not met.
    - Carcinogenicity: Based on available data, the classification criteria are not met.
    - Reproductive toxicity: Based on available data, the classification criteria are not met.
  - STOT-single exposure
    - May cause respiratory irritation. May cause drowsiness or dizziness.
  - STOT-repeated exposure: Based on available data, the classification criteria are not met.
SAFETY DATA SHEET

Trade name: butan-1-ol

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SECTION 12: Ecological information

- 12.1 Toxicity
  - Aquatic toxicity: No further relevant information available.

- 12.2 Persistence and degradability No further relevant information available.

- 12.3 Bioaccumulative potential No further relevant information available.

- 12.4 Mobility in soil No further relevant information available.

- Additional ecological information:
  - General notes:
    Water hazard class 1 (German Regulation) (Assessment by list): slightly hazardous for water
    Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
    Must not reach sewage water or drainage ditch undiluted or unneutralised.

- 12.5 Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.

- 12.6 Other adverse effects No further relevant information available.

SECTION 13: Disposal considerations

- 13.1 Waste treatment methods
  - Recommendation
    Must not be disposed together with household garbage. Do not allow product to reach sewage system.

- European waste catalogue

| HP 3 | Flammable |
| HP 4 | Irritant - skin irritation and eye damage |
| HP 5 | Specific Target Organ Toxicity (STOT)/Aspiration Toxicity |
| HP 6 | Acute Toxicity |

- Uncleaned packaging:
  - Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

- 14.1 UN-Number
  - ADR, IMDG, IATA UN1120

- 14.2 UN proper shipping name
  - ADR UN1120 BUTANOLS
  - IMDG, IATA BUTANOLS

(Contd. on page 8)
14.3 Transport hazard class(es)
- ADR
  - Class 3 (F1) Flammable liquids.
  - Label
- IMDG, IATA
  - Class 3 Flammable liquids.
  - Label

14.4 Packing group
- ADR, IMDG, IATA
- ADR
  - Packing group III
- IMDG
  - Packing group III
- IATA
  - Packing group III

14.5 Environmental hazards:
- Marine pollutant: No
- Special precautions for user
  - Warning: Flammable liquids.
  - Danger code (Kemler): 30
  - EMS Number: 3-06
  - Stowage Category A

14.6 Special precautions for user
- Transport in bulk according to Annex II of Marpol and the IBC Code
  - Not applicable.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
- Transport category 3
- Tunnel restriction code D/E

14.8 Transport/Additional information:
- ADR
  - Limited quantities (LQ) 5L
  - Excepted quantities (EQ) Code: E1
    - Maximum net quantity per inner packaging: 30 ml
    - Maximum net quantity per outer packaging: 1000 ml
- IMDG
  - Limited quantities (LQ) 5L
  - Excepted quantities (EQ) Code: E1
    - Maximum net quantity per inner packaging: 30 ml
    - Maximum net quantity per outer packaging: 1000 ml
- UN "Model Regulation": UN 1120 BUTANOLS, 3, III
SECTION 15: Regulatory information

· 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
· Labelling according to Regulation (EC) No 1272/2008

The substance is classified and labelled according to the CLP regulation.

· Hazard pictograms

GHS02  GHS05  GHS07

· Signal word Danger
· Hazard statements
H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H335-H336 May cause respiratory irritation. May cause drowsiness or dizziness.

· Precautionary statements
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.
P310 Immediately call a POISON CENTER/doctor.
P330 Rinse mouth.
P362+P364 Take off contaminated clothing and wash it before reuse.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· Directive 2012/18/EU
· Named dangerous substances - ANNEX I Substance is not listed.
· Seveso category P5c FLAMMABLE LIQUIDS
· Qualifying quantity (tonnes) for the application of lower-tier requirements 5,000 t
· Qualifying quantity (tonnes) for the application of upper-tier requirements 50,000 t
· REGULATION (EC) No 1907/2006 ANNEX XVII Conditions of restriction: 3, 40
· 15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Product safety department
· Contact: Product safety department
· Abbreviations and acronyms:
  RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
  IATA-DGR: Dangerous Goods Regulations by the “International Air Transport Association” (IATA)
  ICAO: International Civil Aviation Organisation
  ICAO-TI: Technical Instructions by the “International Civil Aviation Organisation” (ICAO)
  ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
Trade name: butan-1-ol

IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
Flam. Liq. 3: Flammable liquids – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
* Data compared to the previous version altered.