SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

> Version: 1.0 Creation Date: Aug 10, 2017 Revision Date: Aug 10, 2017

| | | Kevision Date. Aug 10, 2011 | |
|-----|---|---|--|
| 1. | Identification | | |
| 1.1 | GHS Product identifier | | |
| | Product name | 1-Propoxy-2-propanol (contains 2-Isopropoxy-1- propanol) | |
| 1.2 | Other means of identification | | |
| | Product number Other names | - 1-propoxypropan-2-ol | |
| 1.3 | Recommended use of the chemical and restrictions on use | | |
| | Identified uses Uses advised against | For industry use only. Solvents no data available | |
| 2. | Hazard identification | | |
| 2.1 | Classification of the substance or mixture | | |
| | Flammable liquids, Category 3 | | |
| | Eye irritation, Category 2 | | |
| 2.2 | GHS label elements, including precautionary statements | | |
| | Pictogram(s) | | |
| | Signal word | Warning | |

| Hazard statement(s) | H226 Flammable liquid and vapour | |
|-------------------------------|---|--|
| | H319 Causes serious eye irritation | |
| 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. | |
| | P264 Wash thoroughly after handling. | |
| Response | P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. | |
| | P370+P378 In case of fire: Use to extinguish. | |
| | P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. | |
| | P337+P313 If eye irritation persists: Get medical advice/attention. | |
| Storage | P403+P235 Store in a well-ventilated place. Keep cool. | |
| Disposal | P501 Dispose of contents/container to | |

2.3 Other hazards which do not result in classification

none

3. Composition/information on ingredients

3.1 Substances

| Chemical name | Common names and | CAS | EC | Concentration |
|----------------------|----------------------|----------|--------|---------------|
| Chemical hame | synonyms | number | number | |
| 1-Propoxy-2-propanol | 1-Propoxy-2-propanol | | | |
| (contains 2- | (contains 2- | 1569-01- | | 100% |
| lsopropoxy-1- | lsopropoxy-1- | 3 | none | |
| propanol) | propanol) | | | |

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms/effects, acute and delayed

no data available

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

/SRP:/ 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 if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on the 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. /Poisons A and B/

- 5. Fire-fighting measures
- 5.1 Extinguishing media

Suitable extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Specific hazards arising from the chemical

no data available

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

- 6. Accidental release measures
- 6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

ACCIDENTAL RELEASE MEASURES: Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors 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.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Conditions for safe storage, including any incompatibilities: Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique(without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

| Physical state | clear liquid |
|--------------------------|----------------------|
| Colour | no data available |
| Odour | no data available |
| Melting point/ freezing | 122°C(dec.)(lit.) |
| point | |
| Boiling point or initial | 140-160°C(lit.) |
| boiling point and | |
| boiling range | |
| Flammability | no data available |
| Lower and upper | no data available |
| explosion limit / | |
| flammability limit | |
| Flash point | 46°C |
| Auto-ignition | no data available |
| temperature | |
| Decomposition | no data available |
| temperature | |
| рН | no data available |
| Kinematic viscosity | no data available |
| Solubility | Miscible with water |
| Partition coefficient n- | log Kow = 0.49 (est) |
| octanol/water (log | |

value) Vapour pressure 2.2125 mm Hg at 25°C Density and/or relative 0.885g/mLat 25°C(lit.) density Relative vapour density no data available Particle characteristics no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

no data available

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Incompatible materials: Strong oxidizing agents.

10.6 Hazardous decomposition products

When heated to decomposition it emits acrid smoke and irritating fumes.

11. Toxicological information

Acute toxicity

- · Oral: LD50 Rat oral 2.8 to 3.0 g/kg
- · Inhalation: no data available
- · 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 |
| no data available |
| STOT-repeated exposure |
| no data available |
| Aspiration hazard |
| no data available |

12. Ecological information

12.1 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

12.2 Persistence and degradability

AEROBIC: 1-Propoxy-2-propanol was reported to have a half-life of 10.5 days in an OECD 301A guideline test with a 92% DOC removal(1). In a biodegradation test using an APHA method with 1-propoxy-2-propanol, 64% of the theoretical BOD was reached after 20 days(1).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for 1-propoxy-2-propanol(SRC), using an estimated log Kow of 0.49(1) and a regression-derived equation(1). According to a classification scheme(2), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of 1-propoxy-2-propanol can be estimated to be 2(SRC). According to a classification scheme(2), this estimated Koc value suggests that 1-propoxy-2-propanol is expected to have very high mobility in soil.

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 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.

14. Transport information

14.1 UN Number

ADR/RID: UN3271 IMDG: UN3271

IATA: UN3271

14.2 UN Proper Shipping Name

ADR/RID: ETHERS, N.O.S. IMDG: ETHERS, N.O.S. IATA: ETHERS, N.O.S.

| 14.3 | Transport hazard class(es) | | |
|-----------------------------------|----------------------------|-----------|-----------|
| | ADR/RID: 3 | IMDG: 3 | IATA: 3 |
| 14.4 Packing group, if applicable | | | |
| | ADR/RID: III | IMDG: III | IATA: III |
| 14.5 | Environmental hazards | | |
| | ADR/RID: no | IMDG: no | IATA: no |
| 1 4 6 | | | |

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

- 15. Regulatory information
- 15.1 Safety, health and environmental regulations specific for the product in question

| Chemical name | Common names and synonyms | CAS number | EC number |
|---|--|---------------|-----------|
| 1-Propoxy-2-propanol (contains 2-Isopropoxy-1- propanol) | 1-Propoxy-2-propanol (contains 2-Isopropoxy-1- propanol) | 1569-01- 3 | none |
| European Inventory of Existi (EINECS) | Listed. | | |
| EC Inventory | Listed. | | |
| United States Toxic Substan | Listed. | | |
| China Catalog of Hazardous | Not Listed. | | |
| New Zealand Inventory of Cl | Listed. | | |
| Philippines Inventory of Che (PICCS) | Listed. | | |
| Vietnam National Chemical | Listed. | | |
| Chinese Chemical Inventory of Existing Chemical Substances (China IECSC) | | | Listed. |

16. Other information

Information on revision

| Creation Date | Aug 10, 2017 |
|---------------|--------------|
| Revision Date | Aug 10, 2017 |

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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