

SAFETY DATA SHEET

1. IDENTIFICATION

Product name: R-(-)-2-Butanol

CAS No. : 14898-79-4

Brand: Macklin

Company: Shanghai Macklin Biochemical Co.,Ltd.

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Revision date: 2019/12/12

2. HAZARDS IDENTIFICATION

GHS classification

PHYSICAL HAZARDS

Flammable liquids Category 3

HEALTH HAZARDS

Acute toxicity (Oral) Category 5

Serious eye damage/eye irritation Category 2A

Reproductive toxicity Category 2

Specific target organ toxicity Respiratory tract irritation, Narcotic effects

- Single exposure [Category 3]

ENVIRONMENTAL HAZARDS

Not classified

GHS label elements, including precautionary statements

Pictograms or hazard symbols

Signal word

Warning

Hazard statements

Flammable liquid and vapour

May be harmful if swallowed

Causes serious eye irritation

Suspected of damaging fertility or the unborn child

May cause respiratory irritation

May cause drowsiness or dizziness

Precautionary statements

[Prevention]

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Keep container tightly closed.

Use explosion-proof electrical/ventilating/lighting equipment. Take precautionary measures against ignition by the static discharge and the spark.

Avoid breathing dust/fume/gas/mist/vapours/spray.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/eye protection/face protection.

[Response]

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for

breathing.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

Wash hands thoroughly after handling.

IF exposed or concerned: Get medical advice/attention.

[Storage]

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

[Disposal]

Dispose of contents/container through a waste management company authorized by the local government. Other hazards which do not May form explosive peroxides. result in classification

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture: Substance

Components: R-(-)-2-Butanol

CAS No.: 14898-79-4

Chemical Formula: $C_4H_{10}O$

4. FIRST AID MEASURES

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention.

Skin contact: Remove/Take off immediately all contaminated clothing. Gently wash with plenty of soap and water. Get medical advice/attention.

Eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Get medical advice/attention.

Ingestion: Get medical advice/attention. Rinse mouth.

Most important Headache, Dizziness, Drowsiness, Dry skin, Redness, Pain symptoms/effects, acute and delayed:

Protection of first-aiders: A rescuer should wear personal protective equipment, such as rubber gloves and air-tight goggles.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing Dry chemical, foam, carbon dioxide.
media:

Unsuitable extinguishing Water (It may scatter and spread fire.)
media:

Precautions for firefighters: Fire-extinguishing work is done from the windward and the suitable fire-extinguishing

method according to the surrounding situation is used. Uninvolved persons should evacuate to a safe place. In case of fire in the surroundings: Keep containers cool by spraying with water. Eliminate all ignition sources if safe to do so.

Special protective When extinguishing fire, be sure to wear personal protective equipment. equipment for firefighters:

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, Use extra personal protective equipment (self-contained breathing apparatus). Keep

protective equipment and people away from and upwind of spill/leak. Ensure adequate ventilation. Entry to non-

emergency procedures: involved personnel should be controlled around the leakage area by roping off, etc.

Environmental precautions: Prevent product from entering drains.

Methods and materials for Absorb spilled material in dry sand or inert absorbent before recovering it into an containment and cleaning airtight container. In case of large amount of spillage, contain a spill by bunding.
up: Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.
Prevention of secondary Remove all sources of ignition. Fire-extinguishing devices should be prepared in hazards: case of a fire. Use spark-proof tools and explosion-proof equipment.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical measures: Handling is performed in a well ventilated place. Wear suitable protective equipment.

Prevent generation of vapour or mist. Keep away from heat/sparks/open flame/hot surfaces. -No smoking. Take measures to prevent the build up of electrostatic charge. Use explosion-proof equipment. Wash hands and face thoroughly after handling.

Use a closed system if possible. Use a ventilation, local exhaust if vapour or aerosol will be generated.

Advice on safe handling: Avoid all contact!

Confirm in advance if peroxides exist when operations involving heating such as distillation are carried out. Conditions for safe storage, including any

Conditions for safe storage, including any incompatibilities

Storage conditions: Keep container tightly closed. Store in a cool, dark and well-ventilated place. Store locked up.

Store away from incompatible materials such as oxidizing agents.

Packaging material: Comply with laws.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: Install a closed system or local exhaust. Also install safety shower and eye bath.

Personal protective equipment

Respiratory protection: Half or full facepiece respirator, self-contained breathing apparatus(SCBA), supplied

air respirator, etc. Use respirators approved under appropriate government standards and follow local and national regulations.

Hand protection: Impervious gloves.

Eye protection: Safety goggles. A face-shield, if the situation requires.

Skin and body protection: Impervious protective clothing. Protective boots, if the situation requires.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state (20°C): Liquid

Form: Clear

Colour: Colorless - Almost colorless

Odour: Characteristic

Odour threshold: 2.6 ppm

pH: No data available

Melting point/freezing point: No data available

Boiling point/range: 100°C

Flash point: 24°C

Flammability or explosive limits:

Lower: 1.7%

Upper: 9.8%

Vapour pressure: 2.4kPa/25°C

Vapour density: 2.6

Relative density: 0.81

Solubility(ies):
[Water] Soluble
[Other solvents]
Miscible: Ether, Alcohols
Log Pow: 0.61
Autoignition temperature: 406°C

10. STABILITY AND REACTIVITY

Chemical stability: May form explosive peroxides.
Possibility of hazardous reactions: No special reactivity has been reported.
reactions:
Conditions to avoid: Spark, Open flame, Static discharge, Air
Incompatible materials: Oxidizing agents, Acids, Halogens, Aluminium, Peroxides
Hazardous decomposition products: Carbon monoxide, Carbon dioxide

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: No data available
Skin corrosion/irritation: No data available
Serious eye damage/irritation: No data available
Germ cell mutagenicity: No data available
Carcinogenicity:
IARC = No data available
NTP = No data available
Reproductive toxicity: No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity:
Fish: No data available
Crustacea: No data available
Algae: No data available
Persistence / degradability: No data available
Bioaccumulative potential(BCF): 3
Mobility in soil
Log Pow: 0.61
Soil adsorption (Koc): 50
Henry's Law constant(PaM³/mol): 0.9

13. DISPOSAL CONSIDERATIONS

Recycle to process, if possible. Consult your local regional authorities. You may be able to burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.

14. TRANSPORT INFORMATION

Hazards Class: 3: Flammable liquid.
UN-No: 1120
Proper shipping name: Butanols
Packing group: III

15. REGULATORY INFORMATION

Regulations on the Control over Safety of Dangerous Chemicals (State Council announces on January 26, 2002 and revised on February 16, 2011): Safe use and production, the storage of a dangerous chemical, transport, loading and unloading were prescribed.

16. OTHER INFORMATION

This SDS was prepared sincerely on the basis of the information we could obtained, however, any warranty shall not be given regarding the data contained and the assessment of hazards and

toxicity. Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used, which shall be given the first priority. The products are supposed to be used promptly after purchase in consideration of safety. Some new information or amendments may be added afterwards. If the products are to be used far behind the expected time of use or you have any questions, please feel free to contact us. The stated cautions are for normal handling only. In case of special handling, sufficient care should be taken, in addition to the safety measures suitable for the situation. All chemical products should be treated with the recognition of "having unknown hazards and toxicity", which differ greatly depending on the conditions and handling when in use and/or the conditions and duration of storage. The products must be handled only by those who are familiar with specialized knowledge and have experience or under the guidance of those specialists throughout use from opening to storage and disposal. Safe usage conditions shall be set up on each user's own responsibility.