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MATERIAL SAFETY DATA SHEET

1) Identification

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| Trade names: | ² H(D)-labeled Adenosine 5'-diphosphate / Cytidine 5'- diphosphate / Guanosine 5'- diphosphate / Uridine 5'-diphosphate |
| Article No.: | 128103621/128103821/128103622/ 128103822/128103623/128103823/ 128103624/128103824 |
| Supplier : | Silantes GmbH Gollierstr. 70c D-80339 Munich Tel.: +49(0)89 500 941 0 Fax: +49(0)89 500 941 29 E-mail: info@silantes.com |
| Emergency phone number: | +49(0)89 500 941 0 Language: English Monday to Friday From 10:00 to 15:00 (CET) |
| Recommended use: | research only |
| Restrictions on use: | not for human use |

The product does not meet the specifications of any of the hazard classes outlined by the Globally Harmonized System of Classification and Labelling of Chemicals.*

Therefore it is not necessary for this MSDS to be in compliance with the GHS.

*Canada: Schedule 2 of the Hazardous Product Act (R.S.C., 1985, c. H-3), Current to November 20, 2018 last amended on May 23, 2018

*United States of America: OSHA, 29 CFR 1910.1200(g) and Appendix A and B

2) Hazard identification

Hazard classification:

Not hazardous products within the meaning of Guideline 67/548/EEC

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Label elements:

The product is exempt from the specific labeling requirements on the basis of the calculation procedures of the "General Classification Guidelines for Preparations in the EU" in the latest valid version.

Signal word: not required

Other hazards:

not applicable

Additional information: Chemicals are by their nature hazardous substances. They are therefore only to be handled by appropriately trained personnel exercising the necessary diligence.

3) Composition/Information on ingredients

The product does not contain any hazardous material or substance.

Chemical name:

Adenosine 5'-diphosphate / Cytidine 5'-diphosphate / Guanosine 5'-diphosphate / Uridine 5'-diphosphate

Common name/Synonyms:

rADP / rCDP / rGDP / rUDP

Chemical characterization:

This is a ribonucleoside 5'-diphosphate derived from ²H-labelled *Ralstonia eutropha* RNA.

Content:

Highly purified ribonucleoside 5'-diphosphate, a biochemical compound.

4) First-aid measures

General instructions:

Remove clothing contaminated with product immediately

Inhalation:

Inhale fresh air

Skin contact:

Wash off immediately with water

Contact with eyes:

Lift eyelids and rinse eyes for 10 minutes under running water. Seek medical attention if discomfort continues.

Ingestion:

Rinse out mouth and have affected person drink a glass of water. Do not induce vomiting. If discomfort continues, consult a medical doctor.

Symptoms:

One may feel slight discomfort after ingesting product.

No other symptoms known.

5) Fire-fighting measures

Product is neither self-igniting nor flammable.

Extinguish with:

Consider fire surroundings and choose fire-fighting measures accordingly.

water spray, foam, dry extinguishing powder, carbon dioxide (CO₂)

Do not extinguish with:

water jet

Equipment for fire-fighting:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Hazards arising from fire:

none

6) Accidental release measures

Personal measures/protective equipment:

Wipe up with absorbent material (e.g. cloth, fleece).

Environmental measures:

Do not allow to enter the canalization/surface water/ground water systems.

Cleansing/absorption material:

Absorbent material (e.g. cloth, fleece, paper towel).

Cleansing/absorption procedures:

Absorb mechanically, clean spill site after absorption (e.g. Ethanol)

7) Handling and storage

Handling:

Instructions for safe handling:

In accordance with laboratory guidelines of Employers' Accident Liability Insurance Association (BG-Chemie).

Instructions on fire and explosion protection:

No particular measures required.

Storage:

Requirements for storage areas and containers:

Keep at room temperature.

Incompatible materials:

Store separately from foodstuffs.

Further information on storage requirements:

Store in well-sealed containers.

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Storage category:

LGK 10-13. Other liquids and solids.

Classification according to the Ordinance on Industrial Safety and Health (Betriebssicherheitsverordnung, BetrSichV).

8) Exposure controls/Personal protection

Exposure:

Occupational exposure:

not applicable

Biological exposure:

not applicable

Engineering controls:

no measures must be taken

Ingredients with limit values that require monitoring at the workplace:

The product does not contain any relevant quantities of substances with values that have to be monitored at the workplace.

Personal protective equipment:

General protective and hygiene measures:

Keep separate from foodstuffs, beverages and animal feed.

Immediately remove soiled or saturated clothing.

Wash hands before breaks and after finishing work.

Avoid contact with the eyes and skin.

Protective gloves

Since the product is a preparation made up of several substances, the reliability of glove material cannot be predicted in advanced and must therefore be tested before being put into use.

We suggest Chemical protection gloves, which are tested according to EN 374.

Glove material

The choice of a suitable glove depends not only on the material, but also on other quality characteristics and varies from manufacturer to manufacturer.

We suggest NBR (Nitrile rubber)/thickness: >0,11 mm

Penetration time of the glove material

Information about the exact penetration time has to be obtained from the manufacturer and must be observed.

We suggest >480 minutes (permeation: level 6)

Eye protection

Tight-fitting protective goggles

9) Physical and chemical properties

Appearance:

Form: powder
Colour: colourless
Odour: odourless
Odour threshold: No data available

Melting/Freezing point: no data available
Boiling point/boiling range: no data available
Flash point: no data available
Evaporation rate: no data available
Flammability (solid; gas): not applicable

Lower flammable/explosive limit: The product does not present an explosion hazard

Upper flammable/explosive limit: The product does not present an explosion hazard

Self-igniting: The product is not self-igniting

Vapour pressure: no data available

Vapour density: no data available

Relative density: no data available

Solubility: no data available

Partition coefficient-n-octanol/water: no data available

Auto-ignition temperature: no data available

Thermal decomposition / conditions to be avoided: above 100°C.

Viscosity: no data available

10) Stability and reactivity

Reactivity:

This product is not reactive under normal ambient conditions.

Chemical stability:

The product is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to be avoided:

above 100°C.

Substances to be avoided:

There is no additional information on incompatible materials.

Hazardous reactions:

There are no known hazardous reactions.

Hazardous decomposition products:

None

11) Toxicological information

Acute toxicity:

Classification relevant LD/LC50 values:

There is no quantitative data on the toxicity of this product

On the skin:

Not to be classified as corrosive or irritant to skin.

On the eye:

Not to be classified as seriously damaging to the eye.

Not to be classified as eye irritant.

Inhalation:

Not to be classified as respiratory sensitizer.

Specific target organ toxicity:

Single exposure:

Not to be classified as specific target toxic on single exposure

Repeated exposure:

Not to be classified as specific target toxic on repeated exposure

Symptoms:

On skin:

no data available

Swallowed:

no data available

Inhaled:

no data available

Further information: The product is to be handled with the care necessary when dealing with chemicals.

12) Ecological information

General information:

Water hazard class 1 (self-estimate): low water hazard

Not to be allowed to enter into groundwater, watercourses or canalization.

Aquatic toxicity:

We have no quantitative data on the ecological effects of this product.

Degradability:

The product is biodegradable.

Mobility in Soil

no data available

Bioaccumulative potential

No significant accumulation in organisms.

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13) Disposal considerations

Product:

Recommendation:

Waste disposal requirements vary among the federal states and local councils, so that inquiries should be made about the type of waste disposal at the local authority in question.

Soiled packaging:

Recommendation: Disposal according to official regulations.

14) Transport information

Land transport ADR/RID and GGVS/GGVE (crossborder/inland): -

ADR/RID-GGVS/E Class: -

Remarks: Not subject to transport regulations.

15) Regulatory information

Identification according to EEC guidelines:

According to EEC guidelines/GefStoffV, there are no specific identification requirements for the product.

National regulations:

Classification according to the Ordinance on Industrial Safety and Health (Betriebssicherheitsverordnung, BetrSichV)

Water hazard class: Water hazard class 1 (self estimate): low water hazard.

16) Other information

Information is based on our present knowledge; this shall not constitute a guarantee for any product features nor establish a contractual legal relationship.

Datasheet-issuing department: Product management

Contact person: Dr. Heumann

Date of latest revision: 17.12.2018