1 Chemical Product and Company Identification

Identification of the product

Product Name: Uricase (UAO-201)
Reviced: Apr. 1. 2021
SDS No 937F

Supplier

Name: TOYOBO CO.,LTD.
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Department: Biotechnology Overseas Sales and Marketing Department
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Recommended use and restrictions on use: diagnostic product

2 Hazard Identification

Important hazards: Harmful if Boric acid or Sodium tetraborate are swallowed.

Adverse effects on human health: Lethal dose (Boric acid): Adult 10g, Child 5g

GHS classification

Physical hazards

Health hazards

Acute toxicity: Oral - Category 5
Acute toxicity: Dermal -
Acute toxicity: Inhalation (Gas, Vapour) -
Acute toxicity: Inhalation (Dust, Mist) -
Skin corrosion/irritation - Category 2
Serious eye damage/Eye irritation - Category 2A
Sensitization: Respiratory -
Sensitization: Skin -
Germ cell mutagenicity -
Carcinogenicity -
otoxic to reproduction - Category 2
Specific target organ toxicity:
(Single exposure) Category 1(nervous system, gastrointestinal tract, respiratory organ, kidneys)
(Specific target organ toxicity:
(Repeated exposure) Category 1(nervous system, gastrointestinal tract, respiratory organ, kidneys)
Category 2(testis)
Aspiration hazard -
Environmental hazards -
Acute hazards to the aquatic environment -
Long-term hazards to the aquatic environment -
Hazard to the ozone layer -

GHS Label Elements

Symbol/Pictograms

Signal word: Danger

Hazard statements:
May be harmful if swallowed.
May cause skin irritation.
May cause serious eye irritation.
May damage fertility or the unborn child.
Cause damage to nervous system, gastrointestinal tract, respiratory organ and kidneys.
Cause damage to nervous system, gastrointestinal tract, respiratory organ, kidneys through prolonged or repeated exposure.
Safety Data Sheet

Precautionary statements

Prevention
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not breathe dust/fume.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.

Response
Get medical advice/attention if you feel unwell.
If ON SKIN: Wash with plenty of water/soap. Take off contaminated clothing and wash it before use.
If skin irritation occurs: Get medical advice/attention.
If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advise/attention.
If exposed or concerned: Get medical attention/advice.

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

Disposal
Dispose of contents/container in accordance with local/regional/national/international/regulation.

Important symptoms (Boric acid)
Symptoms of vomit, diarrhea, collapse, erythema may appear after 2-3 hours later and die after 3-5 days later from ingestion.

3 Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Substance/Mixture</th>
<th>Mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Nature</td>
<td>Uricase</td>
</tr>
<tr>
<td>Chemical specificity</td>
<td>Freeze and drying powder including enzyme</td>
</tr>
<tr>
<td>Concentration or concentration range</td>
<td>ca. 31 % (W/W)</td>
</tr>
<tr>
<td>Main components</td>
<td>CAS #</td>
</tr>
<tr>
<td>Uricase</td>
<td>9002-12-4</td>
</tr>
<tr>
<td>Boric acid</td>
<td>10043-35-3</td>
</tr>
<tr>
<td>Sodium tetraborate decahydrate</td>
<td>1303-96-4</td>
</tr>
</tbody>
</table>

Ingredients Contributing to the Hazard

<table>
<thead>
<tr>
<th>Common Chemical name</th>
<th>Boric acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical formula</td>
<td>H₃BO₃</td>
</tr>
<tr>
<td>CAS#</td>
<td>10043-35-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common Chemical name</th>
<th>Sodium tetraborate decahydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical formula</td>
<td>Na₃B₄O₇・10H₂O</td>
</tr>
<tr>
<td>CAS#</td>
<td>1303-96-4</td>
</tr>
</tbody>
</table>

Boron content of this product
ca. 15 % (W/W)
4 First Aid Measures
Inhalation
Remove to fresh air. Consult a physician when unpleasantness occurs.

Skin Contact
Wash off with plenty of water. Consult a physician when inflammation on the skin occurs.

Eye Contact
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Ingestion
Rinse mouth. Swill plentiful amount of water or milk for immediate vomiting. Consult a physician.

Most important symptoms/effects, acute and delayed.
Inhalation: cough, pant, pharyngeal pain, nosebleed.
Skin: dry skin.
Eye: redness, pain
Ingestion: stomachache, derangement, diarrhea, headache, nausea, vomit, lassitude, cramp.

Protection for first-aides
Special notes for doctors
Protector should wear appropriate wear.
Need a rest and medical follow up.

5 Fire Fighting Measures
Specific extinguishing methods
Water spray, dry chemical powder, or carbon dioxide etc.

Precautions for fire-fighters
Firefighter should work from the windward side.

6 Accidental Release Measures
Personal Precautions, protective equipment and emergency procedure.
Wear protective gear to avoid eye/skin contact and inhalation. Do not work at leeward.

Environmental Precautions
High concentrated waste fluid should not be directly discharged into rivers.

Methods and materials for containment and cleaning up.
Take up under vacuum using dust collecting filter, wash residual spill with copious amounts of water. Use cloth, paper or anything similar to soak up the solution leaking out of the container.
(Waste water should be treated with activated sludge or adsorbed with activated carbon etc.)

7 Handling and Storage
Handling
Technical Measures
Wear protective gear to avoid eye/skin contact and inhalation.

Precautions
Do not drop the container to prevent the content popping out.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gear, avoiding contact on eye, skin and cloths.
Ventilate a room to keep air under permissible exposure limit.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.

Safe Handling Advice

Storage
Technical Measures
Keep sealed container in freezer.

Incompatible substances and mixtures
None specified.

Storage Conditions
Store under -20°C to avoid deactivating.

Packaging Materials
Use the initial container of the product.

8 Exposure Controls/Personal Protection
Engineering controls
Provide shower and eye washing apparatus nearby.

Occupational exposure limit, biological limit
TLV: TWA 2mg/m³, STEL 6mg/m³

Personal Protective Equipment
Respiratory Protection
Protecting mask

Hand Protection
Protecting gloves

Eye Protection
Safety goggles

Skin and Body Protection
Long sleeve working wear
9 Physical and Chemical Properties

Physical State, form and color: Powder / White

Odour: No odour

pH: ca. pH 8.5 (1% W/V)

Flash Point: No information available.

Explosiveness: No information available.

Density: No information available.

Solubility: Freely soluble in water.

10 Stability and Reactivity

Stability: Stable at temperatures below -20°C. When left for long at room temperature, proteins might be degraded, which does not cause any hazardous reaction.

Possible hazard reactions at specific condition:

Conditions to avoid: Prolonged storage under higher temperature than room temperature and high humidity.

Materials to avoid: Oxidizing agent

Hazardous Decomposition Products: No information available.

11 Toxicological Information

(1) Boric acid

Acute Toxicity (Oral): Rat LD50 2660mg/kg

Skin corrosion/irritation: Moderate irritation (guinea pig, 24hr, 72hr)

Serious eye damage/irritation: Rubefaction /Pain

Sensitization: No data available

Germ cell mutagenicity: Absence of data on multi-generation mutagenicity tests and germ cell mutagenicity tests in vivo, and negative data on somatic cell mutagenicity tests in vivo (micronucleus tests)

Carcinogenicity: ACGIH (2005): Category A4

Toxic to reproduction: Adverse effects on reproduction of parental animals and development of pups at doses producing no parental toxicity.

Specific target organ toxicity (Single exposure):

Human: Gastrointestinal tract effects such as nausea, vomiting, abdominal pain and diarrhea, and central nerve effects such as lethargy, headaches, fever, increased irritability and muscle convulsion. Irritation of the upper respiratory tract.

Animal: cyanosis, tetany, spasm and shock-like symptoms at dosing levels within the guidance value ranges for Category 1.

Specific target organ toxicity (Repeated exposure):

Human: oliguresis, anuria, and nephropathy including renal tubular necrosis.

(2) Sodium tetraborate

Acute Toxicity (Oral): LD₅₀ 4450mg/kg (Category 5)

Skin corrosion/irritation: May cause dermatitis (Category 2)

Serious eye damage/irritation: May cause strong eye irritation (Category 2A)

Toxic to reproduction: Affect spermatogenesis (Category 2). May damage fertility or the unborn child.

Specific target organ toxicity (Single exposure):

This product causes damage to the nervous system, respiratory organ, kidneys. (Category 1)

Specific target organ toxicity (Repeated exposure):

This product causes damage to the nervous system, respiratory organ, kidneys and testis, through prolonged or repeated exposure. (Category 2)

Aspiration hazard: Not classification
12 Ecological Information

Acute hazards to the aquatic environment
Persistence /Degradability

Polyethylene Glycol-p-octylphenyl Ether (Triton X-100)
LC50/96hr = 3mg/L (bluegill)
This product is biodegradable and does not remain on the
environment for long.
22% by BOD (National Institute of Technology and
Evaluation, Japan)

13 Disposal Considerations

Residues
A pollution container and packing

Dispose of in accordance with all applicable local and
national laws and regulations.
Wash with copious amounts of water and waste conforming to
local regulations depending on the type of the material.

14 Transport Information

International regulations
IMO information
IATA information
Domestic regulations
Rail and road transportation information
Marine transportation information
Aviation transportation information
Specific precautions transport measures and
conditions

Avoid direct sunshine and check the container and loading
to prevent leakage or turnover,fall and damage.Transport
in accordance with regulations.Do not load with foods and
feed. Keep at temperatures below -20 °C.

15 Regulatory Information

Registration, Evaluation, Authorization and Restriction of
Following components of this product are included in SVHC
(Candidate list of authorization).

Common Chemical name
Boric acid
H₃BO₃
10043-35-3

Sodium tetraborate
Na₂B₄O₇・10H₂O
1303-96-4

ca. 11 % (W/W)

16 Other Information

Notice

The information shall not be taken as being all inclusive
and is to be used only a guide.All materials and mixtures
may be present unknown hazards and should be used with
cautions. The SDS is subject to revision as new information
becomes available. The information in this SDS, to the best
of our knowledge, is accurate and correct. However, TOYODO
makes no warranty and assumes no liability whatsoever in
connection with any use of this information.