1 Chemical Product and Company Identification

Identification of the product

Product Code

Ascorbate oxidase

ASO-301

Supplier

Name

TOYOBO CO., LTD.

Address

2-8, Dojimahama 2-chome Kita-ku, Osaka 530-8230, Japan

Department

Biotechnology Overseas Sales and Marketing Department

Phone

+81-6-6348-3843

Fax

+81-6-6348-3833

Recommended use and restrictions on use

diagnostic product

2 Hazard Identification

Important hazards

Hazard statements

This product might be harmful if swallowed, because it contains boric acid and sodium tetraborate.

Lethal dose (Boric acid) : Adult 10g, Child 5g

- May cause skin irritation.
- May cause serious eye irritation.
- Cause damage to nervous system, gastrointestinal tract, respiratory organs, and kidneys.
- Cause damage to testis through prolonged or repeated exposure.
- May be harmful if swallowed.
- May cause skin irritation.
- May cause serious eye irritation.
- Cause damage to nervous system, gastrointestinal tract, respiratory organ, and kidneys.
- Cause damage to testis through prolonged or repeated exposure.

GHS Label Elements

Symbol/Pictograms

Danger
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.

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.

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

Substance/Mixture
Mixture

Chemical Nature
Freeze and drying powder including enzyme

Concentration or concentration range
ca. 11 % (W/W)

Cas #
9029-44-1

Chemical specificity
Ascorbate oxidase

Ingredients Contributing to the Hazard

Common Chemical name
Boric acid

Chemical formula
H₃BO₃

Cas #
10043-35-3

Common Chemical name
Sodium tetraborate decahydrate

Chemical formula
Na₄B₄O₇ • 10H₂O

CAS#
1303-96-4

Boron content of this product
ca. 19 % (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-aiders
Wear protective equipments depending on the situation.

Notes to an attending physician
Rest and medical observation are necessary.
Safety Data Sheet

5 Fire Fighting Measures
Extinguishing media
This product is not flammable. Use extinguishing agent suitable for type of surrounding fire.
Specific hazards
No information available.
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
Wear protective gear to avoid eye/skin contact and inhalation.
Technical Measures
Do not drop the container to prevent the content popping out.
Precautions

Storage
Keep sealed container in freezer.
Technical Measures
None specified.
Incompatible substances and mixtures
Store under -20°C to avoid deactivating.
Storage Conditions
Use the initial container of the product.
Packaging Materials

8 Exposure Controls/Personal Protection
Engineering controls
Provide shower and eye washing apparatus nearby.
Occupational exposure limit, biological limit
(Borate compounds, inorganic) TWA 2mg/m³, STEL 6mg/m³
Not established.
ACGIH TLV(2004)
OSHA
NIOSH
Personal Protective Equipment
Protecting mask
Respiratory Protection
Protecting gloves
Hand Protection
Safety goggles
Eye Protection
Long sleeve working wear
Skin and Body Protection

9 Physical and Chemical Properties
Physical State, form and color
Powder / Light blue
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
Possible hazard reactions at specific condition
Stable at temperatures below -20°C. When left for long at room temperature, proteins might be degraded, which does not cause any hazardous reaction.

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.

(2) Sodium tetraborate
Acute Toxicity (Oral)
LD₅₀ 4450mg/kg (Category 5)
Acute Toxicity (Dermal)
LD₅₀ > 10000mg/kg (HSDB) (Category 4)
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
Boric acid: Fish (Rainbow Trout)
LC50=78.1mg (Boron)/L (96hr)
(Boric acid equivalent 447mg/L)
Persistence /Degradability
Protein and other organic ingredients are biodegradable and does not remain on the environment for long.

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
Not applicable
IATA information
Not applicable
Domestic regulations
Rail and road transportation information
Not applicable
Marine transportation information
Not applicable
Aviation transportation information
Not applicable
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 Chemicals (EU)
A following components of this product are included in SVHC (Candidate list of authorization).
Boric acid
H₃BO₃
10043-35-3
Sodium tetraborate decahydrate
Na₄B₂O₇·10H₂O
1303-96-4
Boron content of this product 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 caution. 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, TOYOGO makes no warranty and assumes no liability whatsoever in connection with any use of this information.