

## Safety Data Sheet

### 1 Chemical Product and Company Identification

Identification of the product	<b>Xanthine oxidase</b>
Product Code	XTO-212
Supplier	
Name	TOYOBO CO.,LTD.
Address	Osaka Umeda Twin Towers South, 1-13-1 Umeda Kita-ku, Osaka 530-0001, Japan
Department	Biotechnology Overseas Sales and Marketing Department
Phone	+81-6-6348-3846
Fax	+81-6-6348-3833
Recommended use and restrictions on use	diagnostic product

### 2 Hazard Identification

Important hazards	This product might be harmful if swallowed, because it contains boric acid.
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#### GHS classification

Physical hazards	-
Health hazards	
Acute toxicity : Oral	-
Acute toxicity : Dermal	-
Acute toxicity : Inhalation (Gas,Vapour)	-
Acute toxicity : Inhalation (Dust,Mist)	-
Skin corrosion/irritation	-
Serious eye damage/Eye irritation	-
Sensitization : Respiratory	-
Sensitization : Skin	-
Germ cell mutagenicity	-
Carcinogenicity	-
Toxic to reproduction	Category 1
Specific target organ toxicity (Single exposure)	Category 2(nervous system, gastrointestinal tract)
Specific target organ toxicity (Repeated exposure)	Category 2(kidneys)
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 damage fertility or the unborn child. May cause damage to nervous system, gastrointestinal tract. May cause damage to kidneys through prolonged or repeated exposure.

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### 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/attentions if you feel unwell. IF exposed or concerned: Get medical advice/attention.
Storage	Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international/regulation.

## 3 Composition/Information on Ingredients

Substance/Mixture	Mixture
Chemical Nature	Xanthine oxidase
Chemical specificity	Freeze and drying powder including enzyme
Concentration or concentration range	ca. 31 % (W/W)
Main components	CAS #
Xanthine oxidase	9002-17-19
Boric acid	10043-35-3
Sodium tetraborate	1303-96-4
BSA	9048-46-8
Monosodium Glutamate	142-47-2
Glycine	56-40-6
Ingredients Contributing to the Hazard	
Common Chemical name	Boric acid
Chemical formula	H <sub>3</sub> BO <sub>3</sub>
Cas #	10043-35-3
Common Chemical name	Sodium tetraborate
Chemical formula	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> · 10H <sub>2</sub> O
CAS#	1303-96-4
Boron content of this product	ca. 1.5 % (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, Sore throat Skin: Redness Eyes: Redness, Pain Ingestion: Abdominal pain. Convulsions. Diarrhoea. Nausea.

## 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.

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### 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.
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	(Boric acid) TLV: TWA 2mg/m <sup>3</sup> , STEL 6mg/m <sup>3</sup>
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 / Red brown
Odour	No odour
pH	ca. pH 7.5 (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.

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### 11 Toxicological Information

#### (1) Boric acid

Acute Toxicity (Oral)  
Skin corrosion/irritation  
Serious eye damage/irritation  
Sensitization  
Germ cell mutagenicity

Rat LD<sub>50</sub> 2660mg/kg  
Moderate irritation (guinea pig, 24hr, 72hr)  
Rubefaction /Pain  
No data available  
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  
Toxic to reproduction

ACGIH (2005): Category A4  
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)

LD<sub>50</sub> 4450mg/kg (Category 5)  
(EHC204) 3493mg/kg, 4500mg/kg, 4980mg/kg, 5660mg/kg, 6080mg/kg  
(ECETOC TR63) 6000mg/kg

Acute Toxicity (Dermal)  
Skin corrosion/irritation  
Serious eye damage/irritation  
Toxic to reproduction

LD<sub>50</sub> > 10000mg/kg (HSDB) (Category 4)  
May cause dermatitis (Category 2)  
May cause strong eye irritation (Category 2A)  
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

Classification not possible

### 12 Ecological Information

Acute hazards to the aquatic environment

Boric acid: Fish (Rainbow Trout)  
LC<sub>50</sub>=78.1mg(Boron)/L(96hr)  
(Boric acid equivalent 447mg/L)

Persistence /Degradability

This product is biodegradable and does not remain on the environment for long.

### 13 Disposal Considerations

Residues

Dispose of in accordance with all applicable local and national laws and regulations.

A pollution container and packing

Wash with copious amounts of water and waste conforming to local regulations depending on the type of the material.

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### 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)

Common Chemical name

Boric acid

Chemical formula

 $H_3BO_3$ 

CAS#

10043-35-3

Common Chemical name

Sodium tetraborate

Chemical formula

 $Na_2B_4O_7 \cdot 10H_2O$ 

CAS#

1303-96-4

Boron content of this product

ca. 1.5 % (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, TOYOBO makes no warranty and assumes no liability whatsoever in connection with any use of this information.