Shanghai Macklin Biochemical Co.,Ltd.
TEL:400-623-8666
FAX:021-50706099
E-mail:sales@macklin.cn
WEB:www.macklin.cn

1. IDENTIFICATION

Product name: Boric acid
CAS No. : 10043-35-3
Brand: Macklin
Company: Shanghai Macklin Biochemical Co.,Ltd.
Address: Shanghai Pudong Zhangjiang High-tech Park; 10th Building, 5F, 88 Darwin Road; SHANGHAI CHINA
Zip code: 201206
Telephone: +86 21-51328699
Fax: +86 21-51821727 /+86 21-51821728
E-mail: sales@macklin.cn; tech@macklin.cn
Revision date: 2015/06/30

2. HAZARDS IDENTIFICATION

GHS classification

PHYSICAL HAZARDS

none

HEALTH HAZARDS

none

ENVIRONMENTAL HAZARDS

none

GHS label elements, including precautionary statements

Pictograms or hazard symbols

Signal word

Danger

Hazard statements

none

Precautionary statements

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name
Boric acid

Components:Boric acid
CAS No.:10043-35-3
Chemical Formula:H_3BO_3

4. FIRST AID MEASURES

4.1
Description of necessary first-aid measures
If inhaled
Fresh air, rest.
Following skin contact
Rinse and then wash skin with water and soap.
Following eye contact

Rinse with plenty of water (remove contact lenses if easily possible).
Following ingestion
Rinse mouth. Do NOT induce vomiting. Refer immediately for medical attention.
4.2
Most important symptoms/effects, acute and delayed
Although no adverse effects have been reported from inhaling boric acid dust, it is absorbed through mucous membranes. Ingestion of 5 grams or more may irritate gastrointestinal tract and affect central nervous system. Contact with dust or aqueous solutions may irritate eyes; no chronic effects have been recognized, but continued contact should be avoided. Dust and solutions are absorbed through burns and open wounds but not through unbroken skin. (USCG, 1999)
4.3
Indication of immediate medical attention and special treatment needed, if necessary
The diagnoses of boric acid poisoning can be confirmed with the measurement of blood or serum boric acid levels (nL=1.4 nmol/mL), but this test is not routinely available. Treatment of boric acid toxicity is mainly supportive. Activated charcoal is not recommended because of its relatively poor adsorptive capacity for boric acid. In cases of massive oral overdose or renal failure, hemodialysis, or perhaps exchange transfusion in infants, may be helpful in shortening the half-life of boric acid.

5. FIRE-FIGHTING MEASURES

5.1
Suitable extinguishing media
Fire Extinguishing Agents: Water fog. (USCG, 1999)
5.2
Specific hazards arising from the chemical
Literature sources indicate that this compound is nonflammable. (NTP, 1992)
5.3
Special protective actions for fire-fighters
In case of fire in the surroundings, use appropriate extinguishing media.

6. ACCIDENTAL RELEASE MEASURES

6.1
Personal precautions, protective equipment and emergency procedures
Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Wash away remainder with plenty of water.
6.2
Environmental precautions
Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Wash away remainder with plenty of water.
6.3
Methods and materials for containment and cleaning up
Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing.Avoid contact with skin and eyes.Avoid formation of dust and aerosols. Use non-sparking tools.Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Separated from strong bases.Preserve in well-closed containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure limit values
TLV: (inhalable fraction): 2 mg/m3, as TWA; 6 mg/m3 as STEL; A4 (not classifiable as a human carcinogen).MAK: (inhalable fraction): 10 mg/m3; peak limitation category: I(1); pregnancy risk

group: B
Biological limit values
no data available
Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Personal protective equipment

Eye/face protection
Wear safety spectacles or eye protection in combination with breathing protection.
Skin protection
Protective gloves. Protective clothing.
Respiratory protection
Use local exhaust or breathing protection.
Thermal hazards
no data available

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state
Solid. Crystalline.
Colour
White.
Odour
Odorless
Melting point/freezing point
> 1 000 °C.
Boiling point or initial boiling point and boiling range
300ºC
Flammability
Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit
no data available
Flash point
no data available
Auto-ignition temperature
Remarks:It has been determined that the test substance was not classified as a pyrophoric solid of class 4.2.
Decomposition temperature
171°C
pH
3,8-4,8 (3,3 % aqueous solution)
Kinematic viscosity
no data available
Solubility
Miscible with water
Partition coefficient n-octanol/water
log Pow = -1.09. Temperature:22 °C.
Vapour pressure
0 Pa. Temperature:25 °C.
Density and/or relative density
1 489 kg/m³. Temperature:23 °C.;1.49. Temperature:23 °C.
Relative vapour density
no data available
Particle characteristics
no data available

10. STABILITY AND REACTIVITY

10.1
Reactivity
Decomposes above 100°C . This produces water and irritant boric anhydride. The solution in water

is a weak acid. Attacks metals. This produces hydrogen. This generates fire and explosion hazard.

10.2

Chemical stability

Stable in air.

10.3

Possibility of hazardous reactions

Not flammableBORIC ACID is a very weak acid. Incompatible with alkali carbonates and hydroxides. During an attempt to make triacetyl borate, a mixture of boric acid and acetic anhydride exploded when heated to 58-60°C [Chem. Eng. News 51:(34) 1973]. Reacts violently with the strong reducing agent potassium metal.

10.4

Conditions to avoid

no data available

10.5

Incompatible materials

During an attempt to make triacetyl borate, a mixture of boric acid and acetic anhydride exploded when heated to 58-60 deg C.

10.6

Hazardous decomposition products

Boric acid decomposes in heat above 100 deg C forming boric anhydride and water.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral: LD50 - rat (male) - 3 450 mg/kg bw. Remarks:Mg boric acid/kg.

Inhalation: LC50 - rat (male/female) - > 2.03 mg/L air.

Dermal: LD50 - rabbit (male/female) - > 2 000 mg/kg bw.

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Cancer Classification: Group E Evidence of Non-carcinogenicity for Humans

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the respiratory tract. May cause mechanical irritation to the eyes. The substance may cause effects on the central nervous system and kidneys. This may result in impaired functions.

STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the testes. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

Aspiration hazard

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly , especially if powdered.

12. ECOLOGICAL INFORMATION

12.1

Toxicity

Toxicity to fish: LC50 - Pimephales promelas - 79.7 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: LC50 - other aquatic mollusc: Lampsilis siliquoidea (Fatmucket mussel) - 137 mg/L - 96 h. Remarks:(Microscopic inspection for movement of foot or cilia).

Toxicity to algae: EC10 - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata,

Selenastrum capricornutum) - 24.5 mg/L - 3 d.
Toxicity to microorganisms: EC50 - activated sludge of a predominantly domestic sewage - > 10 000 mg/L - 3 h. Remarks:Respiration rate.

12.2

Persistence and degradability

No biotransformation processes have been reported for boron compounds(1). Boric acid has been shown to be a mild antiseptic agent with bacteriostatic action(2). A concentration beyond 10 mg/L produces toxicity to activated sludge cultures(3).

12.3

Bioaccumulative potential

Highly water soluble materials are unlikely to bioaccumulate to any significant degree, and borate species are all present essentially as undissociated boric acid at neutral pH(1). The octanol/water partition coefficient for boric acid has been measured as 0.175(1), indicating low bioaccumulation potential(1). Boron did not bioaccumulate in 47-day and 21-day exposure tests using oysters and sockeye salmon respectively(1).

12.4

Mobility in soil

Boric acid adsorption to illite (three-layered clay consisting of two outer layers of hydrated SiO_2 and a central layer of hydrated Al_2O_3) and kaolinite (alternate layers of SiO_2 and Al_2O_3) clays, as well as activated sludge was studied. The compound was added to 100 mL flasks corresponding to a boron concentration range of zero to 256 mg/L. It was observed that kaollinite adsorbed about 40 times (Kd = 0.199 (Freundlich adsorption coefficient)) more boric acid than illinite (Kd = 0.005) at pH 7; five times as much boric acid adsorbed to activated sludge (Kd = 0.025) as to illinite at pH 7(1). Boron adsorption is influenced by the distribution of boron species (H_3BO_3; $B(OH)_4^-$) as well as pH, the type and/or composition of the solution matrix, and surface properties(2). The pKa of boric acid is 9.24(3), indicating that this compound will exist primarily in the undissociated form in the environment, but partially in the anion form in alkaline soils(SRC). However, boric acid is a Lewis acid and therefore behaves as an electron acceptor, rather than a proton donor(3).

12.5

Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. TRANSPORT INFORMATION

14.1

UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)

14.2

UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)

14.3

Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)
14.4
Packing group, if applicable
ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)
14.5
Environmental hazards
ADR/RID: No
IMDG: No
IATA: No
14.6
Special precautions for user
no data available
14.7
Transport in bulk according to IMO instruments
no data available

15. REGULATORY INFORMATION

15.1
Safety, health and environmental regulations specific for the product in question
Chemical name
Common names and synonyms
CAS number
EC number
Boric acid
Boric acid
10043-35-3
233-139-2
European Inventory of Existing Commercial Chemical Substances (EINECS)
Listed.
EC Inventory
Listed.
United States Toxic Substances Control Act (TSCA) Inventory
Listed.
China Catalog of Hazardous chemicals 2015
Listed.
New Zealand Inventory of Chemicals (NZIoC)
Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)
Listed.
Vietnam National Chemical Inventory
Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)
Listed.
Korea Existing Chemicals List (KECL)
Listed.

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.