

OTTO CHEMIE PVT LTD

201, 51-53 Maroo Bhavan, Kalbadevi, Mumbai – 400002, India. Tel : + 91 22 2207 0099 / 6638 2599

Email : info@ottokemi.com, Web : www.ottokemi.com

ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

1. Identification

1.1 GHS Product identifier

Boric acid, 99.999%

Code B 1968

2. Hazard identification

2.1 Classification of the substance or mixture

Reproductive toxicity, Category 1B

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H360FD

Precautionary statement(s)

Prevention

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

P308+P313 IF exposed or concerned: Get medical advice/attention.

Storage

P405 Store locked up.

Disposal

P501 Dispose of contents/container to ...

2.3 Other hazards which do not result in classification

none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
boric acid	boric acid	10043-35-3	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest.

In case of skin contact

Rinse and then wash skin with water and soap.

In case of eye contact

Rinse with plenty of water (remove contact lenses if easily possible).

If swallowed

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 Extinguishing media

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.

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.

Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

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

Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

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

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state colourless or white odourless crystalline solid

Colour Colorless, transparent crystals or white granules or powder

Odour Odorless

Melting point/ freezing point 169 °C

Boiling point or initial boiling point and boiling range 300 °C

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 no data available

Decomposition temperature 171 °C

pH 3,8-4,8 (3,3% aqueous solution)

Kinematic viscosity no data available

Solubility In water: 49.5 g/L (20 °C)

Partition coefficient n-octanol/water (log value) log Kow = 0.175

Vapour pressure 2.6 mm Hg (20 °C)

Density and/or relative density 1.437 g/cm³

Relative vapour density no data available
Particle characteristics no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable in air.

10.3 Possibility of hazardous reactions

Not flammable BORIC 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°C.

10.6 Hazardous decomposition products

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

11. Toxicological information

Acute toxicity

Oral: LD50 Rat oral 3000-4000 mg/kg bw

Inhalation: LC50 Rat inhalation >0.16 mg/L 4hr

Dermal: no data available

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

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

Toxicity to fish: LC50; Species: *Oncorhynchus mykiss* (Rainbow trout); Concentration: 100 ppm for 96 hr (soft water); exposure was initiated subsequent to fertilization and maintained through 4 days posthatching /Conditions of bioassay not specified in source examined

Toxicity to daphnia and other aquatic invertebrates: LC50; Species: *Daphnia magna* (Water flea); Conditions: static bioassay;

Concentration: 133 (115-153) mg/L for 48 hr

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

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 SiO₂ and a central layer of hydrated Al₂O₃) and kaolinite (alternate layers of SiO₂ and Al₂O₃) 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 kaolinite adsorbed about 40 times (K_d = 0.199 (Freundlich adsorption coefficient)) more boric acid than illite (K_d = 0.005) at pH 7; five times as much boric acid adsorbed to activated sludge (K_d = 0.025) as to illite at pH 7(1). Boron adsorption is influenced by the distribution of boron species (H₃BO₃; B(OH)₄⁻) as well as pH, the type and/or composition of the solution matrix, and surface properties(2). The pK_a 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

13.1 Disposal methods

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. IMDG: Not dangerous goods. IATA: Not dangerous goods.

14.2 UN Proper Shipping Name

ADR/RID: unknown

IMDG: unknown

IATA: unknown

14.3 Transport hazard class(es)

ADR/RID: Not dangerous goods. IMDG: Not dangerous goods. IATA: Not dangerous goods.

14.4 Packing group, if applicable

ADR/RID: Not dangerous goods. IMDG: Not dangerous goods. IATA: Not dangerous goods.

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 Annex II of MARPOL 73/78 and the IBC Code

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	none
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.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.