

Chemical Safety Data Sheet MSDS / SDS

Boric acid SDS

Revision Date:2024-04-25 Revision Number:1

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SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product identifier**

Product name: Boric acid
CAS: 10043-35-3

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.
Uses advised against: none

Company Identification

Company: Chemicalbook.in
Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090
Telephone: +91 9550333722

SECTION 2: Hazards identification**Classification of the substance or mixture**

Reproductive toxicity, Category 1B

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

none

Precautionary statement(s)

Prevention

P203 Obtain, read and follow all safety instructions before use.

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

Response

P318 IF exposed or concerned, get medical advice.

Storage

P405 Store locked up.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name: Boric acid

Common names and synonyms: Boric acid

CAS number: 10043-35-3
EC number: 233-139-2
Concentration: 100%

SECTION 4: First aid measures

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.

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)

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.

SECTION 5: Firefighting measures

Suitable extinguishing media

Fire Extinguishing Agents: Water fog. (USCG, 1999)

Specific hazards arising from the chemical

Literature sources indicate that this compound is nonflammable. (NTP, 1992)

Special protective actions for fire-fighters

In case of fire in the surroundings, use appropriate extinguishing media.

SECTION 6: Accidental release measures

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.

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.

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.

SECTION 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.

SECTION 8: Exposure controls/personal protection

Control parameters

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

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

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

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

SECTION 9: Physical and chemical properties and safety characteristics

Physical state: Solid. Crystalline.

Colour:	White.
Odour:	Odorless
Melting point/freezing point:	> 1 000 °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:	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/m ³ . Temperature:23 °C.;1.49. Temperature:23 °C.
Relative vapour density:	no data available
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

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.

Chemical stability

Stable in air.

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.

Conditions to avoid

no data available

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.

Hazardous decomposition products

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

SECTION 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.

SECTION 12: Ecological information

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.

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).

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).

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).

Other adverse effects

no data available

SECTION 13: Disposal considerations

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.

SECTION 14: Transport information

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.)

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.)

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.)

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.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

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.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:
http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:
<http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any