

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 973
SRM Name: Boric Acid (Acidimetric Standard)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is certified as a chemical of known assay and is intended for use as a primary acidimetric standard. A unit of SRM 973 consists 100 g of highly purified boric acid (H₃BO₃) in a bottle.

Company Information

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2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Reproductive Toxicity Category 1B

Label Elements

Symbol



Signal Word

DANGER

Hazard Statement(s)

H360 May damage fertility or the unborn child.

Precautionary Statement(s)

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P280 Wear protective gloves, clothing, and eye protection.
 P308+P313 If exposed or concerned: Get medical attention.
 P405 Store locked up.
 P501 Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: None.

Ingredients(s) with Unknown Acute Toxicity: None.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Boric acid

Other Designations: Orthoboric acid; boracic acid; boric trihydroxide; trihydroxyborane

Components are listed in compliance with OSHA's 29 CFR 1910.1200.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Boric acid	10043-35-3	233-139-2	100

4. FIRST AID MEASURES

Description of First Aid Measures

Inhalation: If adverse effects occur, remove to well-ventilated (uncontaminated) area. If breathing is difficult, qualified personnel may administer oxygen. If not breathing, qualified personnel should give artificial respiration. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Eye Contact: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Ingestion: If a large amount is swallowed, seek medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Respiratory tract irritation, skin irritation, central nervous system depression, kidney damage.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media

Suitable: Use extinguishing agents appropriate to surrounding fire.

Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Not applicable.

Special Protective Equipment and Precautions for Fire-Fighters: Move container from fire area if it can be done without personal risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 2 Fire = 0 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Avoid generating dust. Clean up residue with a high-efficiency particulate filter vacuum. Collect in appropriate container for disposal.

7. HANDLING AND STORAGE

Safe Handling Precautions: Use suitable personal protection equipment (PPE). See Section 8, "Exposure Controls and Personal Protection".

Storage and Incompatible Materials: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits

Boric Acid

ACGIH (TLV): 2 mg/m³ (TWA, inhalable fraction)

ACGIH (TLV): 6 mg/m³ (STEL, inhalable fraction)

Particulates Not Otherwise Regulated (PNOR)

OSHA (PEL): 15 mg/m³ (TWA, total dust)
5 mg/m³ (TWA, respirable fraction)

NIOSH (REL): 15 mg/m³ (TWA, total dust)
5 mg/m³ (TWA, respirable fraction)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection Measures: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate PPE to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye Protection: Splash resistant safety goggles and emergency eyewash are recommended.

Skin and Body Protection: Chemical resistant clothing and gloves are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties	Boric Acid
Molar Mass (g/mol)	61.8330 ^(a)
Molecular Formula	H ₃ BO ₃
Appearance (physical state, color, etc.)	colorless to white powder
Odor	odorless
Odor threshold	not available
pH	5.1 (0.6 %)
Evaporation rate	not applicable
Melting point/freezing point	not applicable
Density (g/cm ³)	1.4844 ^(a)
Vapor Pressure	negligible at 20 °C
Vapor Density (air = 1)	not applicable
Viscosity	not applicable
Solubility(ies)	water solubility: 6.35 % at 30 °C; soluble in hot alcohols, glycerol; moderately soluble in liquid ammonia; slightly soluble in acetone
Partition coefficient (n-octanol/water)	not applicable
Particle Size	not available
Thermal Stability Properties	
Autoignition Temperature	not applicable
Thermal Decomposition	170 °C to 180 °C (338 °F to 356 °F)
Initial boiling point and boiling range	not applicable
Explosive Limits, LEL (Volume %)	not applicable
Explosive Limits, UEL (Volume %)	not applicable
Flash Point	not applicable
Flammability (solid, gas)	not applicable

^(a) Value listed in the NIST Certificate of Analysis.

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: Stable Unstable

Possible Hazardous Reactions: Not applicable.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: Acetic anhydride, iron, potassium.

Hazardous Decomposition: Inorganic acids, anhydrides.

Hazardous Polymerization: Will Occur Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: Inhalation Skin Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Respiratory tract irritation, skin irritation, central nervous system depression, kidney damage.

Potential Health Effects (Acute, Chronic, and Delayed)

Inhalation: Inhalation of may result in irritation of the mucous membranes, sore throat, and coughing. Absorption through the mucous membranes may cause systemic poisoning as described in ingestion.

Skin Contact: Deaths have occurred by skin absorption, particularly in infants and especially if skin is damaged, abraded or burned. Systemic poisoning may result as described in ingestion

Eye Contact: Reported to be non-irritating to the eyes.

Ingestion: Ingestion of this material is unlikely under normal conditions of use. If ingested, effects may include nausea, epigastric pain, hemorrhagic gastritis, bloody vomit and diarrhea, weakness, lethargy, headache, restlessness, tremors and twitching of facial muscles and extremities, intermittent convulsions, and eventual central nervous system depression with confusion, drowsiness, prostration, convulsions, and death. Animal studies indicate prolonged ingestion may cause a variety of reproductive effects.

Numerical Measures of Toxicity

Acute Toxicity: Not classified.

Rat, Oral LD50: 2660 mg/kg

Rat, Inhalation LC50: >0.16 mg/L (4 h)

Rabbit, Dermal LD50: >2000 mg/kg

Skin Corrosion/Irritation: Not classified, no data available.

Serious Eye Damage/Eye Irritation: Not classified, no data available.

Respiratory Sensitization: Not classified, no data available.

Skin Sensitization: Not classified, no data available.

Germ Cell Mutagenicity: Not classified.

Escherichia coli (-S9): 17000 ppm (24 h)

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen Yes No

Boric acid is not listed by OSHA, IARC, or NTP as a carcinogen or potential carcinogen.

Reproductive Toxicity: Category 1B.

Reproductive effects have been reported in animals.

Rat, Oral, TDLo: 250 mg/kg (pregnant 10 d)

Rat, Oral, TDLo: 76 mg/kg (pregnant 20 d)

Specific Target Organ Toxicity, Single Exposure: Not classified, no data available.

Specific Target Organ Toxicity, Repeated Exposure: Not classified, no data available.

Aspiration hazard: Not classified.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Invertebrate: water flea (*Daphnia magna*) EC50: 115 mg/L to 153 mg/L (48 h)

Persistence and Degradability: No data available.

Bioaccumulative Potential: Bioaccumulation is not expected.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT and IATA.

15. REGULATORY INFORMATION

U.S. Regulations

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21)

ACUTE HEALTH:	Yes
CHRONIC HEALTH:	Yes
FIRE:	No
REACTIVE:	No
PRESSURE:	No

State Regulations

California Proposition 65: Not listed.

U.S. TSCA Inventory: Listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations: WHMIS Information is not provided for this material.

16. OTHER INFORMATION

Issue Date: 17 July 2014

Sources: ChemADVISOR, Inc., SDS *Boric Acid*, 21 March 2014.

CDC; NIOSH; *NIOSH Pocket Guide to Chemical Hazards*; Department of Health and Human Services (DHHS), Centers for Disease Control and Prevention (CDC), National Institute for Safety and Health; *Particulates Not Otherwise Regulated*, 4 April 2011; available at <http://www.cdc.gov/niosh/npg/npgd0480.html> (accessed July 2014).

Hazardous Substances Data Bank (HSDB), National Library of Medicine's TOXNET system, *Boric Acid*, CAS No. 10043-35-3; available at <http://toxnet.nlm.nih.gov> (accessed July 2014).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration	STOT	Specific Target Organ Toxicity
LD50	Median Lethal Dose or Lethal Dose, 50 %	STEL	Short Term Exposure Limit
LEL	Lower Explosive Limit	TLV	Threshold Limit Value
MSDS	Material Safety Data Sheet	TPQ	Threshold Planning Quantity
NFPA	National Fire Protection Association	TSCA	Toxic Substances Control Act
NIOSH	National Institute for Occupational Safety and Health	TWA	Time Weighted Average
NIST	National Institute of Standards and Technology	UEL	Upper Explosive Limit
n.o.s.	Not Otherwise Specified	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at <http://www.nist.gov/srm>.