

# Boric Acid

(Material Safety Data Sheet)

## 1. Product Identification

**Synonyms:** ortho-Boric acid; boracic acid; Borofax, boric acid (H<sub>3</sub>BO<sub>3</sub>)

**CAS No.:** 10043-35-3

**Molecular Weight:** 61.83

**Chemical Formula:** H<sub>3</sub>BO<sub>3</sub>

## 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Boric Acid	10043-35-3	100%	Yes

## 3. Hazards Identification

### Emergency Overview

**WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS.**

**SAF-T-DATA<sup>(tm)</sup>** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Life)

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 2 - Moderate (Life)

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Green (General Storage)

### Potential Health Effects

#### Inhalation:

Causes irritation to the mucous membranes of the respiratory tract. May be absorbed from the mucous membranes, and depending on the amount of exposure could result in the development of nausea, vomiting, diarrhea, drowsiness, rash, headache, fall in body temperature, low blood pressure, renal injury, cyanosis, coma, and death.

#### Ingestion:

Symptoms parallel absorption via inhalation. Adult fatal dose reported at 5 to > 30 grams.

#### Skin Contact:

Causes skin irritation. Not significantly absorbed through the intact skin. Readily absorbed through damaged or burned skin. Symptoms of skin absorption parallel inhalation and ingestion.

#### Eye Contact:

Causes irritation, redness, and pain.

**Chronic Exposure:**

Prolonged absorption causes weight loss, vomiting, diarrhea, skin rash, convulsions and anemia. Liver and particularly the kidneys may be susceptible. Studies of dogs and rats have shown that infertility and damage to testes can result from acute or chronic ingestion of boric acid. Evidence of toxic effects on the human reproductive system is inadequate.

**Aggravation of Pre-existing Conditions:**

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

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## 4. First Aid Measures

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:**

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.

**Skin Contact:**

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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## 5. Fire Fighting Measures

**Fire:**

Not considered to be a fire hazard.

**Explosion:**

A mixture of potassium and boric acid may explode on impact.

**Fire Extinguishing Media:**

Use any means suitable for extinguishing surrounding fire.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

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## 7. Handling and Storage

Keep in a well closed container stored under cold to warm conditions, 2 to 40 C, (36 to 104F). Protect against physical damage. Carbon steel or aluminum containers are suitable for storage. Stainless steel is needed for moist conditions. Use good housekeeping practices to prevent accumulation of dust and follow sound cleaning techniques that will keep airborne particulates at a low level. Wash hands after handling this material. Avoid contact especially when skin is cut or abraded. Containers

of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

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## 8. Exposure Controls/Personal Protection

### **Airborne Exposure Limits:**

None established.

### **Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

### **Personal Respirators (NIOSH Approved):**

For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

### **Skin Protection:**

Gloves and lab coat, apron or coveralls.

### **Eye Protection:**

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

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## 9. Physical and Chemical Properties

### **Appearance:**

White powder or granules.

### **Odor:**

Odorless.

### **Solubility:**

1g/18mL in cold water.

### **Density:**

1.43

### **pH:**

5.1 Aqueous solution: (0.1M)

### **% Volatiles by volume @ 21C (70F):**

0

### **Boiling Point:**

Decomposes.

### **Melting Point:**

169C (336F)

### **Vapor Density (Air=1):**

No information found.

### **Vapor Pressure (mm Hg):**

2.6 @ 20C (68F)

### **Evaporation Rate (BuAc=1):**

No information found.

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## 10. Stability and Reactivity

### **Stability:**

Stable under ordinary conditions of use and storage. If moisture is present, boric acid can be corrosive to iron.

**Hazardous Decomposition Products:**

Loses chemically combined water upon heating, forming metaboric acid (HBO<sub>2</sub>) at 212-221F, then pyroboric acid (H<sub>2</sub>B<sub>4</sub>O<sub>7</sub>) at 285-320F, and Boric anhydride at higher temperatures.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Potassium, acetic anhydride, alkalis, carbonates, and hydroxides.

**Conditions to Avoid:**

No information found.

## 11. Toxicological Information

**Toxicological Data:**

Oral rat LD<sub>50</sub>: 2660 mg/kg; oral woman LDLo: 200 mg/kg; investigated as a mutagen, tumorigen, reproductive effector.

**Reproductive Toxicity:**

May impair fertility

May cause harm to the unborn child.

See Chronic Health Hazards.

Ingredient	---NTP Carcinogen---		
	Known	Anticipated	IARC Category
Boric Acid (10043-35-3)	No	No	None

## 12. Ecological Information

**Environmental Fate:**

Boric acid: 48 Hr EC<sub>50</sub> water flea: 115.0 mg/L [Static]

**Environmental Toxicity:**

The EC<sub>50</sub>/48-hour values for daphnia are over 100 mg/l. This material may be toxic to aquatic life.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Other Information

**NFPA Ratings:** Health: 1 Flammability: 0 Reactivity: 0

**Label Hazard Warning:**

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS.

**Label Precautions:**

Avoid breathing dust.

Keep container closed.

Use with adequate ventilation.

Avoid contact with eyes, skin and clothing.

Wash thoroughly after handling.

**Label First Aid:**

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. In all cases call a physician.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.