MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**BORIC ACID, REAGENT (ACS), GRANULAR**
Catalog #	648
Version #	02
Revision date	20-May-2010
CAS #	10043-35-3
Manufacturer information	GFS Chemicals, Inc. P.O. Box 245 Powell, OH 43065 US www.gfschemicals.com Fax 740-881-5989 Phone 740-881-5501 Toll Free 800-858-9682 Emergency Assistance Chemtrec 800-424-8300

2. Hazards Identification

Emergency overview	CAUTION Harmful in contact with skin. Irritating to skin. Irritating to eyes. Avoid prolonged contact with eyes, skin and clothing. Exposure to powder or dusts may be irritating to eyes, nose and throat.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Skin contact. Eye contact.
Eyes	Causes eye irritation. Avoid contact with eyes.
Skin	Harmful in contact with skin. Irritating to skin. Avoid contact with the skin.
Inhalation	Inhalation of dusts may cause respiratory irritation.
Ingestion	Do not ingest.
Potential environmental effects	May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
BORIC ACID	10043-35-3	90 - 100

Composition comments

US ACGIH Threshold Limit Values: Short Term Exposure Limit (STEL): mg/m3

BORIC ACID	10043-35-3	Inhalable fraction. MGM3 - 6

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
Skin contact	Remove and isolate contaminated clothing and shoes. Immediately flush skin with plenty of water. Get medical attention immediately. Wash clothing separately before reuse.
Inhalation	If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Call a physician if symptoms develop or persist.
Ingestion	Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. If ingestion of a large amount does occur, call a poison control center immediately.
General advice	Get medical attention if symptoms occur. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties The product is not flammable. No unusual fire or explosion hazards noted.

Extinguishing media

Suitable extinguishing media Water. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Protection of firefighters

Protective equipment and precautions for firefighters In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers.

Specific methods In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers. Cool containers exposed to flames with water until well after the fire is out.

6. Accidental Release Measures

Personal precautions Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Keep upwind. Keep out of low areas. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation of dust from the spilled material. Wear a dust mask if dust is generated above exposure limits.

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not contaminate water.

Methods for containment If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Prevent entry into waterways, sewer, basements or confined areas.

Methods for cleaning up Should not be released into the environment. Collect dust using a vacuum cleaner equipped with HEPA filter. Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid dust formation. Following product recovery, flush area with water.

7. Handling and Storage

Handling Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Avoid contact with skin. Avoid contact with eyes. Wear personal protective equipment. In case of insufficient ventilation, wear suitable respiratory equipment. Wash thoroughly after handling. Avoid release to the environment. Handle and open container with care.

Storage Store in a well-ventilated place. Keep container tightly closed. Guard against dust accumulation of this material. Use care in handling/storage.

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH

Material	CAS #	Type	Value	Form
BORIC ACID	10043-35-3	STEL	6 mg/m3	Inhalable fraction.
		TWA	2 mg/m3	Inhalable fraction.

Engineering controls Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Respiratory protection Wear respirator with dust filter.

Hand protection Wear protective gloves.

Eye / face protection Avoid contact with eyes. Use tight fitting goggles if dust is generated.

Skin protection Avoid contact with the skin. Wear chemical protective equipment that is specifically recommended by the manufacturer. It may provide little or no thermal protection. Wear suitable protective clothing. Wear protective gloves.

General hygeine considerations Do not breathe dust. Avoid contact with eyes. Avoid contact with skin. Avoid contact with clothing.

General	Avoid contact with skin. Avoid contact with eyes. Ensure that eyewash stations and safety showers are close to the workstation location.

9. Physical & Chemical Properties

Appearance	Granular.
Color	White.
Odor	Odorless.
Odor threshold	Not available.
Physical state	Solid.
Form	Granular.
pH	5.1 (0.1 M solution in water)
Melting point	339.8 °F (171 °C)
Freezing point	Not available.
Boiling point	572 °F (300 °C) (decomposes to B2O3)
Flash point	Not available.
Evaporation rate	Not available.
Flammability	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Specific gravity	1.435
Relative density	1.4349 g/cm3 estimated
Solubility (water)	Soluble.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Percent volatile	0 % estimated
Molecular weight	61.8400 g/mol
Molecular formula	H3BO3

10. Chemical Stability & Reactivity Information

Chemical stability	Material is stable under normal conditions.
Conditions to avoid	Avoid high temperatures.
Incompatible materials	This product may react with strong reducing agents. This product may react with strong alkalies.
Hazardous decomposition products	May include oxides of boron.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Acute effects

Acute Dermal: LD 50

BORIC ACID	10043-35-3	Rabbit 2000 mg/kg

Acute Inhalation: LC 50

BORIC ACID	10043-35-3	Rat 0.002 mg/l 4 h

Acute Oral: LD 50

BORIC ACID	10043-35-3	Dog 2000 mg/kg
BORIC ACID	10043-35-3	Rat 2660 mg/kg
BORIC ACID	10043-35-3	Chicken 2.95 g/kg
BORIC ACID	10043-35-3	Mouse 3450 mg/kg

Acute Toxicity other routes: LD 50

BORIC ACID	10043-35-3	Rat 1400 mg/kg Subcutaneous
BORIC ACID	10043-35-3	Mouse 1240 mg/kg Intravenous
BORIC ACID	10043-35-3	Rat 1330 mg/kg Intravenous
BORIC ACID	10043-35-3	Mouse 1740 mg/kg Subcutaneous
BORIC ACID	10043-35-3	Guinea pig 1200 mg/kg Subcutaneous

Toxicology data for the preparation

Acute LD50: > 2000 mg/kg, Rabbit, Dermal
Acute LD50: 1200 mg/kg, Guinea pig, Other
Acute LD50: 1240 mg/kg, Mouse, Other
Acute LD50: 1740 mg/kg, Mouse, Other
Acute LD50: 1330 mg/kg, Rat, Other
Acute LD50: 1400 mg/kg, Rat, Other
Acute LC50: > 0 mg/l, Rat, Inhalation
Acute LD50: 2.95 g/kg, Chicken, Oral
Acute LD50: 2000 mg/kg, Dog, Oral
Acute LD50: 3450 mg/kg, Mouse, Oral
Acute LD50: 2660 mg/kg, Rat, Oral

Local effects Harmful in contact with skin. Irritating to eyes. Irritating to skin. Inhalation of dusts may cause respiratory irritation.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

US ACGIH Threshold Limit Values: A4 carcinogen

BORIC ACID	10043-35-3	A4 Not classifiable as a human carcinogen.

12. Ecological Information

Ecotoxicity Contains a substance which causes risk of hazardous effects to the environment.

Aquatic plant toxicity: LC 50

BORIC ACID	10043-35-3	Waterweed (Elodea canadensis) 5 mg/l 21 d Static Mortality

Invertebrate Toxicity: EC 50

BORIC ACID	10043-35-3	Water flea (Simocephalus vetulus) 33600 - 196500 mg/l 24 h Static Intoxication
BORIC ACID	10043-35-3	Water flea (Daphnia carinata) 191400 - 376100 mg/l 24 h Static Intoxication
BORIC ACID	10043-35-3	Water flea (Daphnia magna) 264300 - 496700 mg/l 24 h Static Intoxication
BORIC ACID	10043-35-3	Water flea (Ceriodaphnia dubia) 101100 - 232200 mg/l 24 h Static Intoxication
BORIC ACID	10043-35-3	Water flea (Ceriodaphnia pulchella) 71200 - 150900 mg/l 24 h Static Intoxication

Micro-organisms Toxicity: LC 50

BORIC ACID	10043-35-3	Protozoa (Spirostomum ambiguum) 4871 mg/l 48 h Static Mortality
BORIC ACID	10043-35-3	Protozoa (Spirostomum ambiguum) 5825 mg/l 24 h Static Mortality

Environmental effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Persistence and degradability Not available.

13. Disposal Considerations

Disposal instructions Do not allow this material to drain into sewers/water supplies. This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Dispose in accordance with all applicable regulations.

Waste from residues / unused products Not applicable.

14. Transport Information

DOT

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

Section 302 extremely hazardous substance

No

Section 311 hazardous chemical

Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other Information

Further information

HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings

Health: 2
Flammability: 0
Physical hazard: 0

NFPA ratings

Health: 2
Flammability: 0
Instability: 0

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Issue date

20-May-2010

This data sheet contains changes from the previous version in section(s):	This document has undergone significant changes and should be reviewed in its entirety.