Material Safety Data Sheet
Fluoroboric acid

MSDS# 09901

Section 1 - Chemical Product and Company Identification

MSDS Name: Fluoroboric acid
Catalog Numbers: A188-500
Synonyms: Borate(1-), tetrafluoro-, hydrogen; Borofluoracic; Hydrogen tetrafluoroborate; Hydrofluoroboric acid; Tetrafluoroboric acid; Fluoboric acid.

Company Identification:
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
For information in the US, call: 201-796-7100
Emergency Number US: 201-796-7100
CHEMTREC Phone Number, US: 800-424-9300

Section 2 - Composition, Information on Ingredients

Risk Phrases:
CAS#: 7732-18-5
Chemical Name: Water
%: 47-52
EINECS#: 231-791-2

Risk Phrases:
CAS#: 10043-35-3
Chemical Name: Boric acid
%: < 3
EINECS#: 233-139-2

Risk Phrases:
CAS#: 16872-11-0
Chemical Name: Fluoroboric acid
%: 48-50
EINECS#: 240-898-3

Hazard Symbols:

Text for R-phrases see Section 16
Hazard Symbols: C
Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Danger! May cause kidney damage. Causes burns by all exposure routes. Long-term exposure may cause bone and joint changes. Target Organs: Skeletal structures, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Contact with liquid is corrosive to the eyes and causes severe burns. Lachrymator (substance which increases the flow of tears).

Skin: Contact with liquid is corrosive and causes severe burns and ulceration.

Ingestion: Causes gastrointestinal tract burns.

Inhalation: Causes chemical burns to the respiratory tract.

Chronic: Chronic ingestion or inhalation may cause chronic fluoride poisoning (fluorosis) characterized by weight loss, weakness, anemia, brittle bones, and stiff joints. Prolonged or repeated exposure may cause permanent bone structure abnormalities. Chronic ingestion or inhalation may cause weight loss, malaise, anemia, leukopenia (reduction in the number of white blood cells in the blood), discoloration of the teeth and osteosclerosis (the hardening or abnormal density of bone).

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Contact with metals may evolve flammable hydrogen gas. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Autoignition Temperature: Not applicable.

Flash Point: Not applicable.

Explosion Limits: Lower: Not available

Explosion Limits: Upper: Not available

NFPA Rating: health: 3; flammability: 0; instability: 0;

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate
Handling: ventilation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Discard contaminated shoes.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Keep away from strong bases.

**Section 8 - Exposure Controls, Personal Protection**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
<tr>
<td>Boric acid</td>
<td>2 mg/m³ (inhalable fraction, listed under Borate compounds, inorganic); 6 mg/m³ STEL (inhalable fraction, listed under Borate compounds, inorganic)</td>
<td>none listed</td>
<td>none listed</td>
</tr>
<tr>
<td>Fluoroboric acid</td>
<td>2.5 mg/m³ TWA (as F) (listed under Fluorides).</td>
<td>none listed</td>
<td>2.5 mg/m³ TWA (as F) (listed under Fluorides).</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs: Water: None listed Boric acid: None listed Fluoroboric acid: 2.5 mg/m³ TWA (listed under Fluorides)

Engineering Controls:

Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a Respirators: NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Section 9 - Physical and Chemical Properties**

Physical State: Liquid

Color: clear slightly yellow

Odor: Pungent

pH: Not available

Vapor Pressure: 5.1 mm Hg @ 20 deg C

Vapor Density: 3.0 (air=1)

Evaporation Rate: ~ 1.0 (butyl acetate=1)

Viscosity: Not available

Boiling Point: 130 deg C @ 760 mm Hg (266.00°F)

Freezing/Melting Point: -90 deg C (-130.00°F)

Decomposition Temperature: Not available

Solubility in water: Soluble

Specific Gravity/Density: 1.41
Molecular Formula: HBF4
Molecular Weight: 87.81

Section 10 - Stability and Reactivity
Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Excess heat.
Incompatibilities with Other Materials: Active metals, alkalis.
Hazardous Decomposition Products: Boron trifluoride, hydrogen fluoride gas.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

CAS# 7732-18-5: ZC0110000
RTECS#: CAS# 10043-35-3: ED4550000 ED4560000
CAS# 16872-11-0: ED2685000
RTECS:
CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg;

RTECS:
CAS# 10043-35-3: Oral, mouse: LD50 = 3450 mg/kg;
LD50/LC50: Oral, rat: LD50 = 2660 mg/kg;
                Oral, rat: LD50 = 2500 mg/kg;

RTECS:
CAS# 16872-11-0: Oral, rat: LD50 = 100 mg/kg;

Water - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Carcinogenicity: Boric acid - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
                Fluorboric acid - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Not available

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: FLUOROBORIC ACID
Hazard Class: 8
UN Number: UN1775
Packing Group: II
Canada TDG
Shipping Name: FLUOROBORIC ACID
Hazard Class: 8
UN Number: UN1775
Packing Group: II

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols: C
Risk Phrases:
   R 34 Causes burns.
Safety Phrases:
   S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
   S 27 Take off immediately all contaminated clothing.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)
CAS# 7732-18-5: Not available
CAS# 10043-35-3: 1
CAS# 16872-11-0: 1

Canada
CAS# 7732-18-5 is listed on Canada's DSL List
CAS# 10043-35-3 is listed on Canada's DSL List
CAS# 16872-11-0 is listed on Canada's DSL List
Canadian WHMIS Classifications: E
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.
CAS# 10043-35-3 is listed on Canada's Ingredient Disclosure List
CAS# 16872-11-0 is not listed on Canada's Ingredient Disclosure List.

US Federal
TSCA
CAS# 7732-18-5 is listed on the TSCA Inventory.
CAS# 10043-35-3 is listed on the TSCA Inventory.
CAS# 16872-11-0 is listed on the TSCA Inventory.

Section 16 - Other Information
MSDS Creation Date: 6/24/1999
Revision #9 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.