1. **PRODUCT IDENTIFICATION**

**Name:** Boric Acid  
**Synonyms:** boracic acid, orthoboric acid, boron trihydroxide  
**CAS#:** 10043-35-3  
**Europe EC#:** 233-139-2  
**Product Uses:** component of “fracking” fluids, fire-retardant in fabrics, weather-proofing wood, ant poison, high temperature (borosilicate) glass, soldering/brazing flux, & others  

<table>
<thead>
<tr>
<th>In an Emergency:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Canada</strong></td>
<td>Call CANUTEC (collect) (613) 996-6666</td>
</tr>
<tr>
<td><strong>U.S.A.</strong></td>
<td>Call CHEMTREC (800) 424-9300</td>
</tr>
</tbody>
</table>

2. **HAZARDS**

**GHS Class**  
reproductive toxin  
**Signal Words**  
*DANGER*  

**Hazard Statements**  
ingestion* may damage fertility (H360)  

**Canada – WHMIS**  
**Key:**  
D 2A*  
B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C  
D 1 – Immediately Toxic, D 2 – Chronic Toxicity  
C – Oxidising Substance, E – Corrosive  

*NOTE:* Reduces male fertility, but only on repeated ingestion – not a route of industrial exposure.  
Probably doesn’t warrant the signal word “DANGER” or the D 2A WHMIS classification.  

3. **COMPOSITION**

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>TWAEV / TLV</th>
<th>LD₅₀ (mg/kg) ORAL</th>
<th>LD₅₀ (mg/kg) SKIN</th>
<th>LC₅₀ mg/m³ INHALATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric Acid</td>
<td>100%</td>
<td>2</td>
<td>&gt;2000</td>
<td>&gt;2000*</td>
<td>&gt;2000*</td>
</tr>
</tbody>
</table>

* No mortality at this dose.

4. **FIRST AID**

**SKIN:**  
Brush off. Then wash with soap & water. Remove contaminated clothing & do not reuse until laundered.  

**EYES:**  
Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.  

**INHALATION:**  
Remove from contaminated area promptly. **CAUTION:** Rescuer must not endanger himself! If breathing stops, administer artificial respiration and seek medical aid promptly.  

**INGESTION:**  
Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim’s head below hips to prevent inhalation of vomited material. Seek medical help promptly.  

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this non-toxic substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

*Please ensure that this MSDS is given to, and explained to people using this product.*
5. **FLAMMABILITY & FIRE FIGHTING**

Flash Point: cannot burn
Autoignition Temperature: cannot burn
Flammable Limits: cannot burn
Combustion Products: boric anhydride & water
Firefighting Precautions: as for materials sustaining fire; firefighters must wear SCBA
Static Charge Accumulation: cannot accumulate a static charge on agitation or pumping

6. **SPILL PROCEDURES**

Leak Precaution: not applicable – solid material
Handling Spill: ventilate contaminated area; sweep, hovel, & store in closed containers for recycling or disposal

7. **HANDLING & STORAGE**

Store away from heat which can cause decomposition.
Avoid generating or breathing product dust. If dust forms in handling, install adequate ventilation to satisfy limits given below. Avoid prolonged contact with skin & wash work clothes frequently. An eye bath must be available near the workplace.

8. **EXPOSURE CONTROL**

<table>
<thead>
<tr>
<th>Source</th>
<th>Limit</th>
<th>Source</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario TWAEV</td>
<td>2mg/m³</td>
<td>Ontario STEV</td>
<td>not listed</td>
</tr>
<tr>
<td>ACGIH TLV</td>
<td>2mg/m³</td>
<td>ACGIH STEL</td>
<td>6mg/m³</td>
</tr>
<tr>
<td>OSHA PEL</td>
<td>2mg/m³</td>
<td>OSHA STEL</td>
<td>not listed</td>
</tr>
</tbody>
</table>

Ventilation: if dust is raised in handling, install sufficient exhaust ventilation to control airborne titre to above limits

Hands: no special protective gloves required; leather gloves may be worn
Eyes: safety glasses with side shields – always protect the eyes
Clothing: no special protective clothing required; wear overalls with long-sleeves

9. **PHYSICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odour &amp; Appearance</td>
<td>white odourless powder</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>not known – odourless</td>
</tr>
<tr>
<td>Vapour Pressure</td>
<td>not known, essentially zero  – water vapour appears at 100°C as BH₃O₃ starts to decompose</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>not known  – not volatile</td>
</tr>
<tr>
<td>Vapour Density</td>
<td>not applicable – no vapour</td>
</tr>
<tr>
<td>Boiling Range</td>
<td>~300°C / ~572°F  – boiling can only be measured in a sealed system to inhibit decomposition</td>
</tr>
<tr>
<td>Melting Point</td>
<td>168-170°C / 334-338°F  – melting can only be measured in a sealed flask due to decomposition</td>
</tr>
<tr>
<td>Density</td>
<td>1.435kg/litre (15°C / 59°F) – also given as 1.517kg/litre (14°C / 57°F)</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>47g/litre (20°C)</td>
</tr>
<tr>
<td>Also soluble in</td>
<td>ethanol, glycerol &amp; probably other polar solvents</td>
</tr>
<tr>
<td>Log Pₒₜₗ (Octanol/H₂O partition)</td>
<td>-0.717</td>
</tr>
<tr>
<td>Viscosity</td>
<td>not applicable – solid material</td>
</tr>
<tr>
<td>pH</td>
<td>5.1 (0.1 molar solution)</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>62grams/mole</td>
</tr>
</tbody>
</table>

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Product Name: Boric Acid

10. STABILITY / REACTIVITY

Dangerously Reactive With: not known
Also Reactive With: none known
Stability: stable; will not polymerize
Decomposes in Presence of: heat above 100°C / 212°F
Decomposition Products: boric anhydride & water
Sensitive to Mechanical Impact: no

11. TOXICITY

Effects, Acute Exposure
Skin Contact: little to no effect on intact skin (some reports of mild irritation); may irritate broken skin
Skin Absorption: slight; no toxic effects likely by this route – apparently absorbed through abraded skin
Eye Contact: dust may be a mechanical irritant for a short time; saturated solution not irritating to eyes
Inhalation: dust is probably not an irritant
Ingestion: no symptoms known (but induces vomiting in dogs) – not a route of industrial exposure

Effects, Chronic Exposure
General: chronic ingestion at 0.05% of diet no effect in rats; 0.175% atrophied testis plus reduced kidney & liver weight in rats; the 0.525% dose killed all rats by 6 weeks – not a route of industrial exposure
Sensitising: not a sensitisier in humans or animals
Carcinogen/Tumorigen: not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect: no known effect in humans; reproductive toxin (reduced male fertility) in rodents on ingestion
Mutagen: no known effect on humans or animals
Synergistic With: not known
LD₅₀ (oral): 2500, 2660 & 5140mg/kg (rat), 3450mg/kg (mouse)
LD₅₀ (skin): >2000mg/kg (rabbit) – no mortality at this dose
LC₅₀ (inhalation): >2000mg/m³ (rat) – no mortality at this dose

12. ENVIRONMENTAL INFORMATION

Bioaccumulation: not a bioaccumulator
Biodegradation: not known to biodegrade
Abiotic Degradation: not known to degrade abiotically; not sensitive to ultraviolet
Mobility in soil, water: water soluble; probably moves readily in soil & water
Aquatic Toxicity
LC₅₀ (Fish, 72hr): 1020mg/litre (Carassius auratus), 1260mg/litre (Ictalurus punctatus – 120hr)
EC₅₀ (Crustacea, 24hr): 658-875mg/litre (Daphnia magna)
EC₅₀ (Algae): 58mg/litre stimulates growth of: Agmenellum quadruplicatum, Cyclotella cryptica, Duniella tertiolecta, Phaeodactylum tricornutum & Skeletonema costatum; at 270-590mg/litre growth of the above is depressed
EC₅₀ (Bacteria): not known – 10mg/litre is toxic to activated sludge cultures

13. DISPOSAL

Waste Disposal: do not flush to sewer, no recommendation – allow a hazardous waste specialist deal with waste boric acid
Containers: Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use.
Pails: must be vented and thoroughly dried prior to crushing and recycling.
IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years.
Never cut, drill, weld or grind on or near this container, even if empty

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Product Name: Boric Acid

14. TRANSPORT

<table>
<thead>
<tr>
<th>Canada TDG</th>
<th>PIN</th>
<th>UN- not regulated for transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>AND</td>
<td></td>
<td>not regulated for transport</td>
</tr>
<tr>
<td>U.S.A. 49 CFR</td>
<td>Class</td>
<td>not regulated for transport</td>
</tr>
<tr>
<td></td>
<td>Packing Group</td>
<td>not regulated for transport</td>
</tr>
<tr>
<td>Marine Pollutant</td>
<td></td>
<td>not a marine pollutant</td>
</tr>
<tr>
<td>ERAP</td>
<td></td>
<td>not required</td>
</tr>
</tbody>
</table>

15. REGULATIONS

| Canada DSL | on inventory |
| U.S.A. TSCA | on inventory |
| Europe EINECS | on inventory |

U.S.A. Regulations:

Allowable Tolerances: An exemption from the requirement of a tolerance is established for residues of the pesticidal chemical boric acid and its salts, borax (sodium borate decahydrate), disodium octaborate tetrahydrate, boric oxide (boric anhydride), sodium borate and sodium metaborate, in or on raw agricultural commodities when used as an active ingredient in insecticides, herbicides, or fungicides preharvest or postharvest in accordance with good agricultural practices. Residues of boric acid are exempted from the requirement of a tolerance when used in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: sequestrant. Limit: none.

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 2 mg/cu m (inhalable fraction); 15 min Short Term Exposure Limit (STEL): 6 mg/cu m (inhalable fraction). /Borate compounds, inorganic/ A4; Not classifiable as a human carcinogen. /Borate compounds, inorganic/ 8

Federal Drinking Water Guidelines: EPA 600 ug/L /Boron/ 8

State Drinking Water Guidelines: California 1000ug/L /Boron/ New Hampshire 630ug/L /Boron/ Maine 1,400ug/L /Boron/ Minnesota 1,000ug/L /Boron/ Wisconsin 960ug/L /Boron/ 8

FIFRA Requirements: Residues of boric acid are exempted from the requirement of a tolerance when used in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: sequestrant. Limit: none. An exemption from the requirement of a tolerance is established for residues of the pesticidal chemical boric acid and its salts, borax (sodium borate decahydrate), disodium octaborate tetrahydrate, boric oxide (boric anhydride), sodium borate and sodium metaborate, in or on raw agricultural commodities when used as an active ingredient in insecticides, herbicides, or fungicides preharvest or postharvest in accordance with good agricultural practices. Based on the reviews of the generic data for the active ingredients of boric acid and its sodium salts, the Agency has sufficient information on the health effects of boric acid and its sodium salts and their potential for causing adverse effects in fish and wildlife and the environment. Therefore, the Agency concludes that products containing boric acid and its sodium salts for all uses are eligible for reregistration. The Agency has determined that boric acid and its sodium salts, labeled and used as specified in the RED document, will not pose unreasonable risks or adverse effects to humans or the environment. As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their continued use. Under this pesticide reregistration program, EPA examines newer health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether the use of the pesticide does not pose unreasonable risk in accordance to newer safety standards, such as those described in the Food Quality Protection Act of 1996. Borax is found on List A, which contains most food use pesticides and consists of the 194 chemical cases (or 350 individual active ingredients) for which EPA issued registration standards prior to FIFRA ’88. Case No. 0024; Pesticide type: insecticide, fungicide herbicide; Registration Standard Date: 11/01/85; Case Status: RED Approved 9/93; OPP has made a decision that some/all uses of the pesticide are eligible for reregistration, as reflected in a Reregistration Eligibility Decision (RED) decision ; Active ingredient (AI): boric acid; Data Call-in (DCI) Date(s): 2/16/94; AI Status: OPP has completed a Reregistration Eligibility Decision (RED) for the case/AI.

FDA Requirements: Boric acid is an indirect food additive for use only as a component of adhesives. Drug products containing certain active ingredients offered over-the-counter (OTC) for certain uses. A number of active ingredients have been present in OTC drug products for various uses, as described below. However, based on evidence currently available, there are inadequate data to establish general recognition of the safety and effectiveness of these ingredients for the specified uses: boric acid is included in topical acne drug products; dandruff/seborrheic dermatitis psoriasis drug products; skin protectant drug products; astringent drug products; fever blister and cold sore treatment drug products; insect bite and sting drug products; poison ivy, poison oak, poison sumac drug products; ophthalmic anti-infective drug products; diaper rash drug products; and antiseptic drug products.

16. PREPARATION INFORMATION

Prepared for Thames River Chemical by Peter Bursztyn, (705) 734-1577

With data from RTECS, Haz, Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available

Preparation Date: November 2010  Revision Date: November 2013

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