20 MULE TEAM®

Sodium Metaborate 8 Mol

Material Safety Data Sheet
DATE OF ISSUE May 2000
Supersedes November 1999 Version

1 Chemical product and company identification

Product name: Sodium Metaborate 8 Mol
Grade: Technical
Product use: Industrial manufacturing
Chemical formula: $NaBO_2 \cdot 4H_2O$ [$Na_2B_2O_4 \cdot 8H_2O$]
Chemical name/synonyms: Sodium metaborate tetrahydrate
Chemical family: Inorganic borates
CAS registry number: 10555-76-7

(Refer to Section 15 for TSCA/DSL Chemical inventory listing)

MANUFACTURER:
U.S. Borax Inc.
26877 Tourney Road
Valencia, CA 91355-1847

EMERGENCY PHONE NUMBERS:
24 Hr. Medical Info. Service . . . (661) 284-5200
Chemtrec (Spills): . . . . . (800) 424-9300

2 Composition/information on ingredients

This product contains greater than 99 percent (%) sodium metaborate tetrahydrate, $NaBO_2 \cdot 4H_2O$, which is hazardous under the OSHA Hazard Communication Standard and under the Canadian Controlled Products Regulations of the Hazardous Products Act (WHMIS), based on animal chronic toxicity studies. Refer to Sections 3 and 11 for details on hazards.

3 Hazard identification

Emergency overview

Sodium Metaborate 8 Mol is a white, odorless, powder substance that is not flammable, combustible, or explosive. Aqueous solutions of Sodium Metaborate 8 Mol may be strongly alkaline. Sodium Metaborate 8 Mol has a low acute oral toxicity, but may result in dermal or eye irritation due to alkalinity.

Potential ecological effects

Large amounts of Sodium Metaborate 8 Mol can be harmful to plants and other species. Therefore, releases to the environment should be minimized.

Potential health effects

Routes of exposure: Inhalation is the most significant route of exposure in occupational and other settings. Dermal exposure may be a concern because of skin irritation from Sodium Metaborate 8 Mol.
Inhalation: Inhalation is likely to produce irritation because of its alkalinity. Airborne dust concentration should be maintained below 10 mg/m^3.
Eye contact: Sodium Metaborate 8 Mol may cause eye damage. Avoid contact with eyes. Aqueous solutions of Sodium Metaborate 8 Mol may be irritating to eyes upon prolonged or repeated contact. Adequate eye protection should be worn.
Skin contact: Sodium Metaborate 8 Mol may be irritating to intact skin. Repeated skin exposure should be avoided.
Ingestion: Products containing Sodium Metaborate 8 Mol are not intended for ingestion. Sodium Metaborate 8 Mol has a low acute toxicity. Small amounts (e.g., a teaspoon) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.
Cancer: Sodium Metaborate 8 Mol is not a known carcinogen.
Reproductive/developmental: Animal ingestion studies in several species, at high doses, indicate that borates cause reproductive and developmental effects. A human study of occupational exposure to borate dust showed no adverse effect on reproduction.
Target organs: No target organ has been identified in humans. High dose animal ingestion studies indicate the testes are the target organs in male animals.
Signs and symptoms of exposure: Symptoms of accidental over-exposure to Sodium Metaborate 8 Mol might include nausea, vomiting and diarrhea, with delayed effects of skin redness and peeling. These symptoms have been associated with the accidental over-exposure to the related substance boric acid. Refer to Section 11 for details on Toxicological data.

4 First aid measures

Inhalation: If symptoms such as nose or throat irritation are observed, remove person to fresh air.
Eye contact: Because of its alkalinity, greater attention should be given to adequate eye irrigation. Seek medical attention.
Skin contact: Flush skin with water. Remove contaminated clothing. Seek medical attention if irritation persists.
Ingestion: Because of its alkalinity, superficial effects of the mouth and esophagus should be monitored. If irritation is noted, then seek medical attention.
Note to physicians: Treat as a moderately strong alkali exposure. In addition, for ingestion of large amounts (greater than 8 grams), maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Hemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not be used to evaluate severity of poisoning or to guide treatment[1]. Refer to Section 11 for details.

5 Firefighting measures

General hazard: None, because Sodium Metaborate 8 Mol is not flammable, combustible or explosive. The product is itself a flame retardant.

Extinguishing media: Any fire extinguishing media may be used on nearby fires.
Flammability classification (29 CFR 1910.1200): Non-flammable solid.

6 Accidental release measures

General: Sodium Metaborate 8 Mol is a water-soluble, white powder that may, at high concentrations, cause damage to trees or vegetation by root absorption. (Refer to Ecological information, Section 12, for specific information.)

Land spill: Vacuum, shovel or sweep up Sodium Metaborate 8 Mol and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during cleanup and disposal. Protective clothing, waterproof gloves and eye protection should be worn when cleaning up land spills.

Spillage into water: Where possible, remove any intact containers from the water. Advise local water authority that none of the affected water should be used for irrigation or for the abstraction of potable water until natural dilution returns the boron value to its normal environmental background level. (Refer to Sections 12, 13 and 15 for additional information.) Sodium Metaborate 8 Mol is a non-hazardous waste when spilled or disposed of, as defined in the Resource Conservation and Recovery Act (RCRA) regulations (40 CFR 261). (Refer to Regulatory information, Section 15, for additional references.)

7 Handling and storage

General: Protective clothing, waterproof gloves and eye protection should be worn when handling Sodium Metaborate 8 Mol. But dry, indoor storage is recommended. To maintain package integrity and to minimize caking of the product, bags should be handled on a first-in, first-out basis. Good housekeeping procedures should be followed to minimize dust generation and accumulation.

Storage temperature:	Ambient
Storage pressure:	Atmospheric
Special sensitivity:	Moisture (caking)

8 Exposure controls/personal protection

Engineering controls: Use local exhaust ventilation to keep airborne concentrations of Sodium Metaborate 8 Mol dust below permissible exposure levels.

Personal protection: Protective clothing, eye goggles and gloves are recommended for normal industrial exposures. Where airborne concentrations are expected to exceed exposure limits, NIOSH/MSHA certified respirators should be used.

Occupational exposure limits: Sodium metaborate tetrahydrate (Sodium Metaborate 8 Mol) is treated by OSHA, Cal OSHA and ACGIH as "Particulate Not Otherwise Classified" or "Nuisance Dust".

ACGIH/TLV:	10 mg/m^3
Cal OSHA/PEL:	10 mg/m^3
OSHA/PEL (total dust):	15 mg/m^3
OSHA/PEL (respirable dust):	5 mg/m^3

9 Physical and chemical properties

Appearance:	White, odorless, crystalline solid
Specific gravity:	1.74
Vapor pressure:	Negligible @ 20°C
Solubility in water:	41.9% @ 20°C; 109.8% @ 100°C
Melting point:	53.5°C (128°F)
pH @ 20°C:	10.5 (0.1% solution); 11.0 (1.0% solution); 11.4 (4.0% solution)
Molecular weight:	137.88 ($NaBO_2 \cdot 4H_2O$)

10 Stability and reactivity

General: Sodium Metaborate 8 Mol is a stable product.

Incompatible materials and conditions to avoid: Sodium Metaborate 8 Mol reacts as a weak acid which may cause corrosion of base metals. Reaction with strong reducing agents, such as metal hydrides or alkali metals, will generate hydrogen gas, which could create an explosive hazard.

Hazardous decomposition: None.

11 Toxicological information

Acute toxicity

Ingestion: Low acute oral toxicity; LD_{50} in rats is 2330 mg/kg of body weight.
Skin/dermal: No experimental data. LD_{50} is expected to be greater than 2,000 mg/kg of body weight.
Inhalation: No experimental data. Other borates indicate low acute inhalation toxicity. Many years of occupational exposure to boric acid and other borates indicate no increase in pulmonary disease.
Skin irritation: Probable skin irritant based on chemical properties (alkalinity).
Eye irritation: Sodium Metaborate 8 Mol is a probable eye irritant.
Sensitization: No experimental test data. However, other borates are not skin sensitizers.

Other

Reproductive/developmental toxicity: Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes[2]. Studies with the chemically related boric acid in the rat, mouse and rabbit, at high doses, demonstrate developmental effects on the fetus, including fetal weight loss and minor skeletal variations[3, 4]. The doses administered were many times in excess of those to which humans would normally be exposed[5].
Carcinogenicity/mutagenicity: Boric acid did not produce any evidence of carcinogenicity in mice[6], nor was any mutagenic activity observed in a battery of short-term mutagenicity assays.
Human data: Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility[7].

12 Ecological information

Ecotoxicity data

General: Boron (B) is the element in sodium metaborate tetrahydrate (Sodium Metaborate 8 Mol) which is used by convention to report borate product ecological effects. It occurs naturally in seawater at an average concentration of 5 mg B/L and generally occurs in freshwater at concentrations up to 1 mg B/L. In dilute aqueous solutions the predominant boron species present is undissociated boric acid. To convert sodium metaborate tetrahydrate into the equivalent boron (B) content, multiply by 0.0784.
Phytotoxicity: Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in higher quantities. Care should be taken to minimize the amount of Sodium Metaborate 8 Mol released to the environment.
Algal toxicity:
Green algae, *Scenedesmus subspicatus*
96-hr EC_{10} = 24 mg B/L†
Invertebrate toxicity[8]**:**
Daphnids, *Daphnia magna straus*
24-hr EC_{50} = 242 mg B/L†

Fish toxicity:
Seawater[9]:
Dab, *Limanda limanda*
96-hr LC_{50} = 74 mg B/L†
Freshwater[10]:
Rainbow trout, *S. gairdneri* (embryo-larval stage)
24-day LC_{50} = 88 mg B/L†
32-day LC_{50} = 54 mg B/L†
Goldfish, *Carassius auratus* (embryo-larval stage)
7-day LC_{50} = 65 mg B/L†
3-day LC_{50} = 71 mg B/L†

Environmental fate data

Persistence/degradation: Boron is naturally occurring and ubiquitous in the environment. Sodium Metaborate 8 Mol decomposes in the environment to natural borate.
Octanol/water partition coefficient: No value. In aqueous solution sodium metaborate tetrahydrate is converted substantially into undissociated boric acid.
Soil mobility: Sodium Metaborate 8 Mol is soluble in water and is leachable through normal soil.

Test substance: † sodium tetraborate

13 Disposal considerations

Disposal guidance: Small quantities of Sodium Metaborate 8 Mol can usually be disposed of at landfill sites. No special disposal treatment is required, but local authorities should be consulted about any specific local requirements. Tonnage quantities of product should, if possible, be used for an appropriate application.

RCRA (40 CFR 261): Sodium Metaborate 8 Mol is not listed under any sections of the Federal Resource Conservation and Recovery Act (RCRA).
NPRI (Canada): Sodium Metaborate 8 Mol is not listed on the Canadian National Pollutant Release Inventory.

Refer to Section 15 for additional regulatory information.

14 Transport information

DOT hazardous classification: Sodium Metaborate 8 Mol is not regulated by the U.S. Department of Transportation (DOT) and is therefore not considered a hazardous material/substance.
TDG Canadian transportation: Sodium Metaborate 8 Mol is not regulated under Transportation of Dangerous Goods (TDG).

International transportation: Sodium Metaborate 8 Mol has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

15 Regulatory information

OSHA/Cal OSHA: This MSDS document meets the requirements of both OSHA (29 CFR 1910.1200) and Cal OSHA (Title 8 CCR 5194 (g)) hazard communication standards. Refer to Section 8 for regulatory exposure limits.

WHMIS classification: Sodium metaborate tetrahydrate (Sodium Metaborate 8 Mol) is classified as Class D-Division 2A under Canadian WHMIS guidelines.

Chemical inventory listing: Sodium metaborate tetrahydrate (Sodium Metaborate 8 Mol), 7775-19-1, appears on several chemical inventory lists (including the EPA TSCA inventory, Canadian DSL, European EINECS, Japanese MITI, Australian and Korean lists) under the CAS No. representing the anhydrous form of this inorganic salt.

U.S. EPA TSCA Inventory	7775-19-1
Canadian DSL	77775-19-1
EINECS	231-891-6
South Korea	9212-856
Japanese MITI	(1)-69

RCRA: Sodium metaborate tetrahydrate is not listed as a hazardous waste under any sections of the Resource Conservation and Recovery Act (RCRA) or regulations (40 CFR 261 *et seq*).

Superfund: CERCLA/SARA. Sodium metaborate tetrahydrate is not listed under CERCLA or its 1986 amendments, SARA, including substances listed under Section 313 of SARA, Toxic Chemicals, 42 USC 11023, 40 CFR 372.65, Section 302 of SARA, Extremely Hazardous Substances, 42 USC 11002, 40 CFR 355, or the CERCLA Hazardous Substances list, 42 USC 9604, 40 CFR 302.

Safe Drinking Water Act (SDWA): Sodium metaborate tetrahydrate is not regulated under the SDWA, 42 USC 300g-1, 40 CFR 141 *et seq*. Consult state and local regulations for possible water quality advisories regarding boron compounds.

Clean Water Act (CWA) (Federal Water Pollution Control Act): 33 USC 1251 *et seq*.

a) Sodium metaborate tetrahydrate (Sodium Metaborate 8 Mol) is not itself a discharge covered by any water quality criteria of Section 304 of the CWA, 33 USC 1314.
b) It is not on the Section 307 List of Priority Pollutants, 33 USC 1317, 40 CFR 129.
c) It is not on the Section 311 List of Hazardous Substances, 33 USC 1321, 40 CFR 116.

Canadian drinking water guideline: An "Interim Maximum Acceptable Concentration" (IMAC) for boron is currently set at 5 mg B/L.

IARC: The International Agency for Research on Cancer (IARC) (a unit of the World Health Organization) does not list or categorize sodium metaborate tetrahydrate as a carcinogen.

NTP Biennial Report on Carcinogens: Sodium metaborate tetrahydrate is not listed.

OSHA carcinogen: Sodium metaborate tetrahydrate is not listed.

California Proposition 65: Sodium metaborate tetrahydrate (Sodium Metaborate 8 Mol) is not listed on the Proposition 65 list of carcinogens or reproductive toxicants.

Clean Air Act (Montreal Protocol): Sodium Metaborate 8 Mol was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

16 Other information

References

1. Litovitz T L, Norman S A, Veltri J C, Annual Report of the American Association of Poison Control Centers Data Collection System. Am. J. Emerg. Med. **4**: 427-458 (1986).
2. Weir R J, Fisher R S, Toxicol. Appl. Pharmacol. **23**: 351-364 (1972).
3. Fail *et al*., Fund. Appl. Toxicol. **17**: 225-239 (1991).
4. Price *et al*., J. Am. Coll. Toxicol. **14**: (2), 173 (Abst. P-17) (1995).
5. Murray F J, Regul. Toxicol. Pharmacol. (Dec. 1995).
6. National Toxicology Program (NTP)–Toxicology and carcinogenesis studies of boric acid in B6C3F1 mice, Tech. Report Ser. No. 324, U.S. Dept. of Health and Human Services. NIH Publ. No. 88-2580 (1987).
7. Whorton *et al*., Occup. Environ. Med. **51**: 761-767 (1994).
8. Schöberl *et al.*, Tenside Surfactants Detergents **25**: 99-107 (1988).
9. Hugman S J, Mance G, Water Research Centre Report 616-M (1983).
10. Butterwick L, de Oude N, Raymond K, Ecotoxicol. Environ. Safety **17**: 339-371 (1989).

For general information on the toxicology of inorganic borates, see Patty's Industrial Hygiene and Toxicology, 4th Ed., Vol. II, (1994), Chap. 42, Boron; ECETOC Tech. Report No. 63 (1995).

Product label text hazard information*:

- May be harmful if swallowed.
- May cause eye damage.
- May be irritating to skin.
- Ingestion may cause reproductive harm or birth defects based on animal data.
- Avoid contamination of food or feed.
- Not for use in food, drug, or pesticides.
- Refer to MSDS.
- KEEP OUT OF REACH OF CHILDREN.

*The WHMIS panel format is used for Canadian product.

National Fire Protection Assoc. (NFPA) classification:

Health	0
Flammability	0
Reactivity	0

Hazardous Materials Information Systems (HMIS):

Red: (Flammability)	0
Yellow: (Reactivity)	0
Blue: (Acute Health)	1*

*Chronic Effects

For further information contact:

U.S. Borax Inc.
Occupational Health & Product Safety Department
(661) 287-6050