MATERIAL SAFETY DATA SHEET

BORAX 10 mol

sodium tetraborate decahydrate

PRODUCT NAME: SODIUM TETRABORATE DECAHYDRATE, Borax 10 mol, Borax 10Ph
COMPOSITION/INFORMATION ON INGREDIENTS
FORMULA: $Na_2B_4O_7:10H_2O$
CHEMICAL NAME: Sodium Tetraborate Decahydrate
SYNONYMS: Borax, Disodium Tetraborate Decahydrate, Sodium Diborate Decahydrate, Deca Borax, Borax 10 mol Ph
CAS Number: 1303-96-4
Composition: >99%

NFPA	**HMIS**
Health 0	Health 0
Flammability 0	Flammability 0
Reactivity 0	Reactivity 1*

*Chronic Effects

HAZARDS IDENTIFICATION

Emergency overview: Borax 10mol is a white, odorless, granular or powdery substance that is not flammable, combustible, or explosive. It has low acute oral and dermal toxicity.
Potential ecological effects: Large amounts of Borax can be harmful to plants and other species. Releases to the environment should be minimized.
Routes of exposure: Inhalation of small particles is the most significant route of exposure in occupational and other settings. Dermal exposure is not usually a concern since borax 10 mol is poorly absorbed through intact skin.
Inhalation: Occasional mild irritation effects to the nose and throat may occur from inhalation of borax 10 mol dust at levels greater than 10 mg/m3.
Eye contact: Borax 10 mol is not irritating to the eyes in normal industrial use.
Skin contact: Borax 10 mol does not cause irritation to intact skin.
Ingestion: Products containing borax 10 mol are not intended for human ingestion. Borax 10 mol has a low acute toxicity. Small amounts (such as a teaspoon) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal discomfort or other symptoms.
Cancer: Borax 10 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 dogs.
Signs and symptoms of exposure: Accidental over-exposure to borax 10 mol might include nausea, vomiting and diarrhea, with delayed effects of skin redness and peeling. These symptoms have been associated with the accidental overexposure to the chemically related substance boric acid.

FIRST AID

Inhalation: Remove person to fresh air if symptoms such as nose or throat irritation are observed.
Eye contact: Use eye wash fountain or fresh water to clean eyes. Seek medical attention if irritation persists for more than 30 minutes.
Skin contact: No treatment necessary because non-irritating.
Ingestion: Swallowing small quantities (such as a teaspoon) will cause no harm to healthy adults. Give two glasses of water if larger amounts are swallowed and seek medical advice.
Note to physicians: Observation only is required for adult ingestion in the range of 4-8 grams of borax 10 mol. For ingestion of larger amounts, 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.

FIRE FIGHTING MEASURES

General hazard: None. Borax 10 mol is non-flammable, non-combustible and not explosive. The product is often used as a flame retardant.
Extinguishing media: Any fire extinguishing media may be used on fires.
Flammability classification (29 CFR 1910.1200): Non-flammable solid.

ACCIDENTAL RELEASE INFORMATION

General: Borax 10 mol is a water-soluble white granule or powder that may, at high

concentrations, cause damage to trees or vegetation by root absorption.
Spill: Vacuum, shovel or sweep borax 10 mol and place in containers for disposal in accordance with applicable regulations for your area. Avoid contamination of bodies of water during cleanup and disposal. Personal protective equipment is not needed to cleanup land spills.
Release into water: Remove any intact containers from the water where possible. 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. Borax 10 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).

HANDLING AND STORAGE

General: No special handling precautions are required. Dry, indoor storage is recommended. Use good manufacturing procedures and common sense to minimize dust generation related to handling.
Storage temperature: Ambient
Storage pressure: Atmospheric
Special sensitivity: Moisture (caking when exposed to high-humidity environments)

EXPOSURE AND PERSONAL PROTECTION

General: Use local exhaust ventilation to keep airborne concentrations of dust below permissible exposure levels.
Personal protection: NIOSH/MSHA certified respirators should be used where airborne concentrations are expected to exceed exposure limits. Eye goggles and gloves are not required for normal industrial exposures, but should be use if environment is excessively dusty.
Occupational exposure limits: Sodium tetraborate decahydrate is regulated by OSHA, Cal OSHA and ACGIH.
ACGIH/TLV: 5 mg/m3
Cal OSHA/PEL: 5 mg/m3
OSHA/PEL (total dust): 10 mg/m3

PHYSICAL PROPERTIES

Appearance: White, odorless, crystalline solid
Specific gravity: 1.71
Vapor pressure: Negligible @ 20°C
Solubility in water: 4.71% @ 20°C; 65.64% @ 100°C
Melting point: 62°C (144°F) (heated in closed space)
pH @ 20°C: 9.3 (0.1% solution); 9.2 (1.0% solution); 9.3
(4.7% solution)
Molecular weight: 381.37

STABILITY AND REACTIVITY

General: Borax 10 mol is a stable product but loses water when heated and may eventually forming anhydrous borax (Na2B4O7).
Incompatible materials and conditions to avoid: 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.

TOXICITY INFORMATION

Acute toxicity
Ingestion: Low acute oral toxicity; LD50 in rats is 4,500 to 5,000 mg/kg of body weight.
Skin/dermal: Low acute dermal toxicity; LD50 in rabbits is greater than 10,000 mg/kg of body weight. Borax 10 mol is poorly absorbed through intact skin.
Inhalation: Low acute inhalation toxicity; LC50 in rats is greater than 2.0 mg/L (or g/m3).
Skin irritation: Non-irritant.
Eye irritation: Draize test in rabbits produced eye irritation effects. Fifty years of occupational exposure to borax 10 mol indicates no adverse effects on human eye. Borax 10 mol is not considered to be a human eye irritant in normal industrial use.
Sensitization: Borax 10 mol is not a skin sensitizer.
Reproductive/developmental toxicity: Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes. Doses administered were many times in excess of those to which humans would normally be exposed.
Carcinogenicity/mutagenicity: No evidence of carcinogenicity in mice. No mutagenic activity was observed for boric acid, a chemically related substance, 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 sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility.

ECOLOGICAL INFORMATION

General: Boron (B) is the element in sodium tetraborate decahydrate (borax 10 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 fresh water at concentrations up to 1 mg B/L. In dilute aqueous solutions the predominant boron species present is undissociated boric acid. To convert sodium tetraborate decahydrate into the equivalent boron (B) content, multiply by 0.1134.

Phytotoxicity: Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in large quantities. Care should be taken to minimize the amount of borax 10 mol released to the environment.
Algal toxicity: Green algae, *Scenedesmus subspicatus* 96-hr EC10 = 24 mg B/L†
Invertebrate toxicity: Daphnids, *Daphnia magna straus* 24-hr EC50 = 242 mg B/L†
Fish toxicity: Sea-water9: Dab, *Limanda limanda* 96-hr LC50 = 74 mg B/L†
Fresh water10: Rainbow trout, *S. gairdneri* (embryo-larval stage)
24-day LC50 = 88 mg B/L†
32-day LC50 = 54 mg B/L†
Goldfish, *Carassius auratus* (embryo-larval stage)
7-day LC50 = 65 mg B/L†
3-day LC50 = 71 mg B/L†
Test substance: † sodium tetraborate
Environmental fate data
Persistence/degradation: Boron is naturally occurring and ubiquitous in the environment. Borax decomposes in the environment to natural borate.
Octanol/water partition coefficient: No value. In aqueous solution Sodium tetraborate decahydrate is converted substantially into undissociated boric acid.
Soil mobility: Borax is soluble in water and is leachable through normal soil.

DISPOSAL GUIDELINES

Disposal guidance: Small quantities of borax 10 mol can usually be disposed of at landfill sites. No special disposal treatment is required. Local authorities should be consulted about any specific local regulations. Tonnage quantities of product should be used for an appropriate application.
RCRA (40 CFR 261): Borax 10 mol is not listed under any sections of the Federal Resource Conservation and Recovery Act (RCRA).
NPRI (Canada): Borax is not listed on the Canadian National Pollutant Release Inventory.

TRANSPORTATION

DOT hazardous classification: Sodium tetraborate decahydrate (borax 10 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 tetraborate decahydrate (borax 10 mol) is not regulated under Transportation of Dangerous Goods (TDG).
International transportation: Sodium tetraborate decahydrate (borax 10 mol) has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

REGULATORY INFORMATION

WHMIS classification: Sodium tetraborate decahydrate (borax 10 mol) is classified as Class D- Division 2A under Canadian WHMIS guidelines.
Chemical inventory listing: Sodium tetraborate decahydrate (borax 10 mol), CAS 1303-96-4, appears on several chemical inventory lists (including the EPA TSCA inventory 1303-96-4, Canadian DSL 1303-96-4, European EINECS 215-540-4, Japanese MITI (1)-69, Australian, and Korean 9212-848 lists) under the CAS No. representing this inorganic salt.
RCRA: Sodium tetraborate decahydrate is not listed as a hazardous waste under any sections of the Resource Conservation and Recovery Act (RCRA) or regulations (40 CFR261 *et seq*).
Superfund: CERCLA/SARA. Sodium tetraborate decahydrate 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 tetraborate decahydrate is not regulated under the SDWA, 42 USC 300g-1, 40CFR 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 tetraborate decahydrate (borax 10 mol) is not itself adischarge 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, 33USC 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 tetraborate decahydrate as a carcinogen.
NTP Biennial Report on Carcinogens: Sodium tetraborate decahydrate is not listed.
OSHA carcinogen: Sodium tetraborate decahydrate is not listed.
California Proposition 65: Sodium tetraborate decahydrate (borax 10 mol) is not listed on the Proposition 65 list of carcinogens or reproductive toxicants.
Federal Food, Drug and Cosmetic Act: Pursuant to 21 CFR175.105, 176.180 and 181.30, Borax is approved by the FDA for use in adhesive components of packaging materials,

as a component of paper coatings on such materials, or for use in the manufacture thereof, which materials are expected to come in contact with dry food products.
Clean Air Act (Montreal Protocol): Borax 10 mol was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

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