THREE ELEPHANT DISODIUM OCTABORATE TETRAHYDRATE TECHNICAL

Material Safety Data Sheet

PESTICIDE: EPA Registration No. 64745-4 [Not for food or Drug Use -- ONLY For Manufacturing Use]

Imported by: Searles Valley Minerals
13200 Main Street
P.O. Box 367
Trona, CA 93592

Manufactured by: Società Chimica Larderello SpA
via Liguria 24
20143 Milano, Italy

Section I - CHEMICAL PRODUCT & COMPANY IDENTIFICATION

PRODUCT NAME: Three Elephant Disodium Octaborate Tetrahydrate Technical --- Pesticide: EPA Reg. #64745-4
MANUFACTURER: Società Chimica Larderello SpA
via Liguria 24
20143 Milano, Italy
EMERGENCY PHONE NUMBER: 24 Hour Information Service: 760-372-2291
CHEMTREC: (800) 424-9300
PREPARATION/REVISION DATE: May 2, 2006
Supersedes: April 12, 2004, February 20, 2002 & October 22, 1999

Section II - COMPOSITION/INFORMATION ON INGREDIENTS

NOTE: See Section 15 for Exposure Limits.

PRODUCT NAME: Disodium Octaborate Tetrahydrate
FORMULA: Na₂B₈O₁₃.4H₂O
CHEMICAL NAME: Sodium Octaborate Tetrahydrate
SYNONYMS: Sodium Octaborate Tetrahydrate; DOT; Foliarel
COMPONENTS:

Material: Sodium Octaborate Tetrahydrate
CAS Number: 12280-03-4
Percent: > 99% (Label Claims = 99.98%)

Sodium Octaborate Tetrahydrate is hazardous under the OSHA Hazard Communication Standard based on animal chronic toxicity studies of similar organic Borates.

Section III - HAZARDS IDENTIFICATION

NOTE: Sodium Octaborate Tetrahydrate is chemically and toxicologically related to Boric Acid; the majority of the Borate chronic toxicity studies were conducted using Boric Acid. Sodium Octaborate Tetrahydrate is converted to Boric Acid in biological systems. The Boric Acid data is discussed in this section can be converted to Sodium Octaborate Tetrahydrate equivalent data by dividing by a factor of 1.1991.

EMERGENCY OVERVIEW: Sodium Octaborate Tetrahydrate is a white odorless, powdered substance that is not flammable, combustible, or explosive, and it presents no unusual hazard if involved in a fire. Sodium Octaborate Tetrahydrate presents little or no hazard (to humans) and has low acute oral and dermal toxicities. Care should be taken to minimize the amount of Sodium Octaborate Tetrahydrate released to the environment to avoid ecological effects.

ROUTES OF EXPOSURE: In the occupational setting, inhalation is the most important route of exposure. Dermal absorption is usually not important because Sodium Octaborate Tetrahydrate is not absorbed through the intact skin.

INHALATION: Mild irritation to nose and throat may occur when the PEL or TLV are exceeded (see Section 15).

EYE CONTACT: Sodium Octaborate Tetrahydrate is non-irritating to eyes in normal industrial use.

DERMAL CONTACT: Sodium Octaborate Tetrahydrate is non-irritating to the intact skin.

INGESTION: Sodium Octaborate Tetrahydrate is not intended for ingestion. Amounts greater than one teaspoonful, when ingested, may cause gastrointestinal problems.

CANCER: Sodium Octaborate Tetrahydrate is not considered a carcinogen.

REPRODUCTIVE: A human study of a highly exposed Borate dust to worker population showed no adverse reproductive effects in males. Animal studies of similar organic Borates demonstrated reproductive effects in males.

TARGET ORGANS: No target organs have been determined in humans. High dose animal ingestion studies indicate that the testes is the target organ.

SIGNS AND SYMPTOMS OF EXPOSURE: Symptoms of accidental over-exposure to Borates have been associated with ingestion or absorption through large areas of damaged skin. These may include nausea, vomiting, and diarrhea, with delayed effects of skin redness and peeling.

See Section 11 for details on Toxicological Data.

Section IV - EMERGENCY & FIRST AID PROCEDURES

HAZARDS TO HUMANS AND DOMESTIC ANIMALS: CAUTION Harmful if swallowed or inhaled. Causes moderate eye irritation. Avoid contact with eyes or clothing. Avoid breathing dust. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash clothing before reuse.

STATEMENT OF PRACTICAL TREATMENT: If swallowed: Call a physician or poison control center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger [or if available, by administering syrup of ipecac]. If person is unconscious, do not give anything by mouth and do not induce vomiting. If Inhaled:
Section V - FIRE FIGHTING MEASURES

GENERAL HAZARD: Sodium Octaborate Tetrahydrate is not flammable, combustible, or explosive. Sodium Octaborate Tetrahydrate presents no unusual hazards when involved in a fire. This product is an inherent fire-retardant.

UEL/LEL: Not Applicable
FLASH POINT: Not Applicable
AUTOIGNITION TEMPERATURE: Not Applicable

EXTINGUISHING MEDIA: Any fire extinguishing media may be used on nearby fires.

Section VI - ACCIDENTAL RELEASE MEASURES

ENVIRONMENTAL HAZARD: Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

Section VII - HANDLING & STORAGE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling

CAUTION: Keep out of Reach of Children

HYGIENIC PRACTICES: Wash hands thoroughly with soap and water after handling, and before eating, drinking, or smoking.

STORAGE AND DISPOSAL: Do not contaminate water, food or feed by storage or disposal. STORAGE: Store in a cool, dry area away from heat. PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. CONTAINER DISPOSAL: completely empty bags into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. Observe all Federal, state and local regulations concerning disposal of waste pesticide and containers. FORMULATORS AND REPACKAGERS USING THIS PRODUCT ARE RESPONSIBLE FOR OBTAINING ENVIRONMENTAL PROTECTION AGENCY (EPA) REGISTRATION FOR THEIR PRODUCTS. (Refer to PR Notice 95-1 for the applicability of the Environmental Hazards statement to your product.) This product is a soluble inorganic powder which may be used for the formulation of products for the following registered end-use patterns: 1) Algaecides for water treatment in swimming pools; 2) Bacteriostats for use in impregnating or otherwise applying to absorbent material(s) to inhibit the growth of odor-causing bacteria when applied at a rate of 0.015 to 0.37% w/w (approximately) equivalent boron; 3) Insecticides for mop, spot and crack and crevice treatment in homes, residential, industrial, institutional and commercial buildings and in transportation equipment; 4) Insecticide/fungicide for wood treatment.

Section VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use local exhaust ventilation to keep airborne levels below exposure limits (see Section 15).

EYE PROTECTION: Use goggles or vented safety glasses in excessively dusty conditions.

SKIN PROTECTION: Not required under normal conditions. Use if excessively dusty or if skin is damaged.

RESPIRATORY PROTECTION: Use appropriate NIOSH/MSHA certified respirators when levels are expected to exceed exposure limits (see Section 15).

Section IX - PHYSICAL & CHEMICAL PROPERTIES

SOLUBILITY IN WATER: 14.8% @ 20°C; 33.4% @ 50°C
APPEARANCE: White powder solid, odorless.
MOLECULAR WEIGHT: 412.52
BOILING POINT: Not Applicable
MELTING POINT: Not Applicable
pH VALUE: At 20°C: 8.62; 10% solution - 7.6
FLASH POINT: None
SPECIFIC GRAVITY: Not Available
VAPOR PRESSURE: Not Applicable
Bulk Density: 18.4 Lbs./CuFt.

Section X - STABILITY & REACTIVITY DATA

STABILITY: Sodium Octaborate Tetrahydrate is stable under normal conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: None known.
HAZARDOUS POLYMERIZATION: Will not occur.
INCOMPATIBILITY: Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas which could create an explosive hazard.

Section XI - TOXICOLOGICAL EFFECTS

NOTE: Sodium Octaborate Tetrahydrate is chemically and toxicologically related to Boric Acid; the majority of the Borate chronic toxicology studies were conducted using Boric Acid. Sodium Octaborate Tetrahydrate is converted to Boric Acid in biological systems. The Boric Acid data discussed in this section can be converted to Sodium Octaborate Tetrahydrate equivalent data by dividing by a factor of 1.1992.

EYES: Boric Acid, when applied to the eyes of albino rabbits (Draize test), produced effects of mild erythema and mild to moderate discharge in 5 of 6 rabbits. All signs subsided by the fourth day after application. Fifty years of occupational exposure history indicates no human eye injury from exposure to Boric Acid.
SKIN: Boric Acid was applied to the skin of albino rabbits. Slight to no irritation persisted 72 hours after application. No evidence of tissue damage was found. Low acute dermal toxicity, LD₅₀ for rabbits is greater than 2,000 mg/kg of body weight (test conducted per 16 CFR 1500.41).

INHALATION: Respiratory effects were addressed in a study using workers exposed to differing levels of Borate dust. Acute effects were throat irritation and cough. No adverse chronic pulmonary effects were discovered in these workers. No animal data available.

INGESTION: Low acute oral toxicity for Sodium Octaborate Tetrahydrate of LD₅₀ for rats is 2,500 mg/kg of body weight.

CARCINOGENICITY: Sodium Octaborate Tetrahydrate is not listed as a carcinogen by the Environmental Protection Agency (EPA), the State of California, or the International Agency for Research on Cancer (IARC).

REPRODUCTIVE: A human study of occupationally exposed Borate worker population showed no adverse reproductive effects. Animal studies indicate that Boric Acid reduces or inhibits sperm production, causes testicular atrophy, and, when given to pregnant animals during gestation, may cause developmental changes. These feed studies were conducted under chronic exposure conditions leading to doses many times in excess of those that could occur through Inhalation of dust in the occupational setting.

Dietary levels of Boric Acid of 6,700 ppm in chronic feeding studies in rats and dogs produced testicular changes [Weir, Fisher, 1972]. In chronic feeding studies of mice on diets containing 5,000 ppm Boric Acid, testicular atrophy was present, while mice fed 2,500 ppm Boric Acid showed no significant increase in testicular atrophy. In another chronic Boric Acid study, degeneration of seminiferous tubules was present together with a reduction of germ cells in mice fed 4,500 ppm Boric Acid. In a reproduction study on rats, 2,000 ppm of dietary Boric Acid had no adverse effect on lactation, litter size, weight and appearance [Weir, Fisher, 1972]. In a continuous breeding study in mice, there was a reduction in fertility rates in males receiving 4,500 ppm Boric Acid, but not for females receiving 4,500 ppm Boric Acid [Fail et al., 1992].

Boric Acid at dietary levels of 1,000 ppm administered to pregnant female rats throughout gestation caused a slight reduction in fetal weight, but was considered close to NOAEL. Doses of 2,000 ppm and above caused fetal malformations and maternal toxicity. In mice, the no effect level for fetal weight reduction and maternal toxicity was 1,000 ppm Boric Acid. Fetal weight loss was noted at dietary levels of 2,000 ppm and above. Malformations (agenesis or shortening of the thirteenth rib) were seen at 4,000 ppm [Heindal et al., 1992].

**Section XII - ECOLOGICAL DATA**

NOTE: Boron is the element in Sodium Octaborate Tetrahydrate that is used to characterize Borate product ecological effects. To convert Sodium Octaborate Tetrahydrate data to Boron (B), multiply by 0.2096.

FISH TOXICITY: Boron (see Note) naturally occurs in seawater at an average concentration of 5 mg B/liter. In laboratory studies the acute toxicity (96-hr LC₅₀) for under-yearling Coho salmon (Onchorhynchus kisutch) in seawater was determined as 40 mg/B/L added as Sodium Metaborate). The Minimum Lethal Dose for minnows exposed to Boric Acid at 20°C for 6 hours is 18,000 to 19,000 mg/l in distilled water, 19,000 to 19,500 in hard water.

- Rainbow trout (S. gairdneri)
  - 24-hour LC₅₀ = 150.0 mg/B/L
  - 36-hour NOEC-LOEC = 0.75-1 mg/B/L
- Goldfish (Carassius auratus)
  - 7-day NOEC-LOEC = 26.50 mg/B/L
- 3-day LC₅₀ = 178 mg/B/L

BIRD TOXICITY: Dietary levels of 100 mg/kg resulted in reduced growth of female mallards. As little as 30 mg/kg fed to mallard adults adversely affected the growth rate of offspring.

INVERTEBRATE TOXICITY:

- Daphnids
  - 48-hour LC₅₀ = 133 mg/B/L
  - 21-day NOEC-LOEC = 6-13 mg/B/L

PHYTOTOXICITY: Although boron is an essential micro-nutrient for healthy growth of plants, it can be harmful to boron-sensitive plants in higher quantities. Plants and trees can easily be exposed by root absorption to toxic levels of boron in the form of water soluble borate leached into nearby waters or soil. Care should be taken to minimize the amount of boron released to the environment.

ENVIRONMENTAL FATE DATA:

- Persistence/Degradation: Boron is naturally occurring and is commonly found in the environment. Sodium Octaborate Tetrahydrate decomposes in the environment to natural Borate.

- Soil Mobility: The product is soluble in water and is leachable through normal soil.

**Section XIII - DISPOSAL CONSIDERATIONS**

DISPOSAL GUIDANCE: See Section 7.

**Section XIV - TRANSPORT REGULATIONS**

US DEPARTMENT of TRANSPORTATION (DOT) IDENTIFICATION NUMBER: Sodium Octaborate Tetrahydrate is not a U.S. Department of Transportation (DOT) Hazardous Material or Hazardous Substance.

INTERNATIONAL TRANSPORTATION: Sodium Octaborate Tetrahydrate has no U.N. number, and is not regulated under international rail, highway, water, or air transport regulations.

CANADIAN TRANSPORTATION: Transporation of Dangerous Goods (TDG) is not regulated.

**Section XV - REGULATORY INFORMATION**

- TSCA NUMBER: 12008-41-2
- RCRA (40 CFR 261): Not listed under any section.
- CERCLA (SUPERFUND): Not listed under any section.
- CLEAN WATER ACT (CWA): Sodium Octaborate Tetrahydrate is not regulated by any water quality criteria under Section 304, is not listed as priority pollutant under Section 307, and is not listed as a hazardous substance under Section 311.
- SAFE DRINKING WATER ACT (SDWA): Not regulated under SDWA, 42 USC 300g-1, 40 CFR 141 et seq. Consult state and local regulations for possible water quality advisories involving boron.
- OCCUPATIONAL EXPOSURE LIMITS: Sodium Octaborate Tetrahydrate is listed/regulated by OSHA, CAL OSHA & ACGIH as “Particulate Not Otherwise Classified”
Sodium Octaborate Tetrahydrate  Page 4 of 4  Società Chimica Larderello SpA

Section XVI - OTHER INFORMATION

OTHER INFORMATION:
Product Label Text Hazard Information:

- May be harmful if swallowed.
- May cause reproductive harm or birth defects based on animal data.
- Avoid contamination of food or feed.
- Not for food, drug or pesticidal use.
- Practice good housekeeping.
- Refer to MSDS.
- KEEP OUT OF THE REACH OF CHILDREN

National Fire Protection Association (NFPA) Classification: 4= Severe, 3= Serious, 2= Moderate, 1= Slight, 0= Minimal
- Health 0
- Flammability 0
- Reactivity 0

Hazardous Materials Information Systems (HMIS):
4 = Extreme, 3 = High, 2 = Moderate, 1 = Slight, 0 = Insignificant
- Blue: (Acute Health) 0
- Red: (Flammability) 0
- Yellow: (Reactivity) 0
- Chronic Effects (for explanation see Section 11)

NOTICE

Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Società Chimica Larderello SpA and Searles Valley Minerals extend no warranties, make no representations, and assume no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

REFERENCES


American Conference of Governmental Industrial Hygienists (ACGIH). 1986. Documentation of threshold limit values and biological exposure indices. 5th ed. Cincinnati, OH.

American Conference of Governmental Industrial Hygienists (ACGIH). 1990. 1990-1991 Threshold limit values for chemical substances and physical agents and biological exposure indices. Cincinnati, OH.


