

MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE: January 1, 2009

BOROSSET V

CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	BOROSSET V	MANUFACTURER:	InCide® Technologies, Inc.
Chemical Formula:	$\text{Na}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$		50 N. 41st Avenue
Chemical Name/Synonyms:	Sodium Tetraborate Pentahydrate		Phoenix, AZ 85009
Chemical Family:	Inorganic Borates		
CAS Registry Number:	11130-12-4		
TSCA Inventory Number:	Not listed		

EMERGENCY PHONE NUMBERS:

CHEMTREC:	800-424-9300
InCide® Technologies, Inc.	602-233-0756

COMPOSITION/INFORMATION ON INGREDIENTS OSHA HAZARDS

This product contains greater than 99 percent (%) Sodium Tetraborate Pentahydrate ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$) CAS No. 11130-12-4. Sodium Tetraborate Pentahydrate is hazardous under the OSHA Hazard Communication Standard based on animal chronic toxicity studies of similar inorganic borate chemicals.

HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:

BOROSSET V is a white, odorless, powdered substance that is not flammable, combustible, or explosive, and it presents no unusual hazard if involved in a fire. BOROSSET V presents little or no hazard (to humans) and has low acute oral and even lower dermal toxicity. Care should be taken to minimize the amount of BOROSSET V released to the environment to avoid ecological effects.

POTENTIAL ECOLOGICAL EFFECTS:

Large amounts of BOROSSET V can be harmful to boron-sensitive plants and other ecological systems.

POTENTIAL HEALTH EFFECTS:

Routes of Exposure: Inhalation is the most significant route of exposure in occupational and other settings. Dermal exposure is not usually a concern because BOROSSET V is not absorbed through intact skin.

Inhalation: Occasional mild irritation of nose and throat may occur from inhalation of BOROSSET V dusts at levels greater than 10 mg/m³.

Eye Contact: BOROSSET V is non-irritating to eyes in normal industrial use.

Skin Contact: BOROSSET V does not cause irritation to intact skin

Ingestion: Products containing BOROSSET V are not intended for ingestion. BOROSSET V has a relatively low acute toxicity. Small amounts (e.g. a teaspoonful) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.

Cancer: BOROSSET V is not considered a carcinogen.

Reproductive: Long-term, high dose animal ingestion studies of similar inorganic borate chemicals have demonstrated reproductive effects in male animals. A human study of occupational exposure to borate dust showed no adverse effect to reproduction.

Developmental: Multiple high dose animal ingestion studies of similar inorganic borate chemicals have demonstrated developmental effects in fetuses of pregnant animals, including fetal weight loss.

Target Organs: No target organ has been identified in humans. Multiple high dose animal ingestion studies of similar inorganic borate chemicals indicate the testes are the target organs in male animals.

Signs and Symptoms of Exposure: Symptoms of accidental over-exposure to borate products have been associated with ingestion or by absorption through large areas of damaged skin. These may include nausea, vomiting, and diarrhea, with delayed effects of skin redness and peeling. Refer to Toxicology Section for details.

FIRST AID MEASURES

Inhalation: No specific treatment is necessary since BOROSSET V is not likely to be hazardous by inhalation. Prolonged exposure to dust levels in excess of regulatory limits should always be avoided.

Eye Contact: Use eye wash fountain or fresh water to cleanse eye. If irritation persists for more than 30 minutes, seek medical attention.

Skin Contact: No treatment necessary because non-irritating.

Ingestion: Swallowing less than one teaspoon will cause no harm to healthy adults. If larger amounts are swallowed, give two glasses of water to drink and seek medical attention.

NOTE TO PHYSICIANS: Observation only is required for adult ingestion of a few grams of BOROSSET V. For ingestion in excess 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.

InCide® Technologies, Inc. - BOROSET V**FIRE FIGHTING MEASURES**

General Hazard: None, because BOROSET V is not flammable, combustible or explosive. The product itself is a flame retardant.

Extinguishing Media: Any fire extinguishing media may be used on nearby fires.

Flammability Classification (29 CFR 1910, 1200): Non-flammable solid.

ACCIDENTAL RELEASE MEASURES

General: BOROSET V is a water-soluble white powder that may cause damage to trees or vegetation by root absorption. (Refer to Ecological information for specific information)

Land Spill: Vacuum, shovel or sweep up BOROSET V and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during clean up and disposal. No personal protective equipment is needed to clean up land spills

Water Spill: BOROSET V will cause localized contamination of surrounding waters depending on the quantity dissolved in these waters. At high concentrations some damage to local vegetation, fish and other aquatic life may be expected.

BOROSET V 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 for additional references and information regarding EPA and California regulations.)

HANDLING AND STORAGE

Storage Temperature: Ambient

Storage Pressure: Atmospheric

Special Sensitivity: Moisture (Caking)

General: No special handling precautions are required, 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.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use local exhaust ventilation to keep airborne concentrations of BOROSET V dust below permissible exposure levels.

Personal Protection: Where airborne concentrations are expected to exceed exposure limits, NIOSH/MSHA certified respirators must be used. Eye goggles and gloves are not required for normal industrial exposures, but may be warranted if environment is excessively dusty.

Occupational Exposure Limits: BOROSET V is listed/regulated by OSHA, Cal OSHA and ACGIH as "Particulate Not Otherwise Classified" or "Nuisance Dust".

OSHA: PEL*	15 mg/m ³ total dust and 5 mg/m ³ respirable dust
ACGIH: TLV**	10 mg/m ³
Cal OSHA: PEL*	10 mg/m ³

*PEL="Permissible Exposure Limit"

**TLV-"Threshold Limit Value"

PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White, odorless powder	Melting Point:	Not Applicable
Boiling Point:	Not Applicable	Flash Point:	None
Vapor Pressure:	Not Applicable	Specific Gravity:	1.82
pH:	9.3 (2.0% solution) @ 25° C	Water Soluble:	Yes

STABILITY AND REACTIVITY

General: BOROSET V is a stable product, but when heated it begins losing water of crystallization at 128° C, and converts to the anhydrous form which fuses at 742° C.

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 known

TOXICOLOGICAL INFORMATION

INGESTION (ACUTE ORAL TOXICITY): Low acute oral toxicity; LD₅₀ of BOROSET V in rats is 3500 mg/kg of body weight.

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SKIN:(ACUTE DERMAL TOXICITY): Low acute dermal toxicity; LD₅₀ of BOROSET V in rabbits is greater than 2000 mg/kg of body weight. BOROSET V is not absorbed through intact skin.

PRIMARY SKIN IRRITATION INDEX: 0 (Zero), BOROSET V is non-corrosive

EYE: Draize test in rabbits produced mild eye irritation effects. Many years of occupational exposure history reflects no indication of human eye injury from exposure to BOROSET V.

INHALATION: Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to BOROSET V dust.

CARCINOGENICITY: A Technical Report issued by the National Toxicology Program showed "no evidence of carcinogenicity" from a full 2-year bioassay on BOROSET V in mice at feed doses of 2500 and 5000 ppm in the diet. No mutagenic activity was observed for BOROSET V in a recent battery of four short-term mutagenicity assays.

REPRODUCTIVE/DEVELOPMENTAL TOXICITY: Animal studies indicate BOROSET V 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 occupational settings.

Reproductive Toxicity (Fertility): Dietary BOROSET V levels of 6,700 ppm in chronic feeding studies in rats and dogs produced testicular atrophy, while dogs and rats receiving 2000 ppm did not develop testicular changes (¹Weir, Fisher, 1972). In chronic feeding studies of mice on diets containing 5000 ppm (550 mg/kg/d) BOROSET V testicular atrophy was present while mice fed 2500 ppm (275 mg/kg/d) BOROSET V showed no significant increase in testicular atrophy (²NTP, 1987). In another BOROSET V chronic study, in mice given 4500 ppm (636mg/kg/d), degeneration of seminiferous tubules was present together with a reduction of germ cells, while at 1000 ppm (152 mg/kg/d) no effect was seen (³Fail et al., 1991). In a reproduction study on rats, 2000 ppm of dietary BOROSET V had no adverse effect on lactation, litter size, weight and appearance (¹Weir, Fisher, 1972). In a continuous breeding study in mice there was reduction in fertility rates for males receiving 4500 ppm (636 mg/kg/d) BOROSET V but not for females receiving 4500 ppm BOROSET V (³Fail et al., 1991)

Developmental Toxicity: BOROSET V at dietary levels of 1000 ppm (78 mg/kg/d) administered to pregnant female rats throughout gestation caused a slight reduction in fetal weight, but was considered to be close to the NOAEL. Doses of 2000 ppm (163 mg/kg/d) and above caused fetal malformations and maternal toxicity. In mice the no effect level for fetal weight reduction and maternal toxicity was 1000 ppm (248 mg/kg/d) BOROSET V. Fetal weight loss was noted at dietary BOROSET V levels of 2000 ppm (452 mg/kg/d) and above. Malformations (agenesis or shortening of the thirteenth rib) were seen at 4000 ppm (1003 mg/kg/d), (⁴Heindel et al., 1992).

¹ (Weir, R.J. and Fisher, R.S., Toxicol. Appl. Pharmacol., 23:351-364 (1974))

² (National Toxicology Program (NTP)-Technical Report Series No. TR324, NIH Publication NO. 88-2580 (1987),PB88-213475/XAB)

³ (Fail et al., Fund. Appl. Toxicol. 17, 225-239 (1991))

⁴ (Heindel et al., Fund Appl. Toxicol. 18, 266-277 (1992))

ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

Phytotoxicity: Although boron is an essential micronutrient for healthy growth of boron-sensitive plants, it can be harmful to 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 soil or waters. Care should be taken to minimize the amount of borate product released to the environment.

Fish Toxicity: Boron naturally occurs in sea water at an average concentration of 5 mg B/liter. In laboratory studies the acute toxicity (96-hr LC₅₀) for under-yearling Coho salmon (*Oncorhynchus kisutch*) in sea water was determined as 40 mg B/L (added as sodium metaborate). Boron concentrations in fresh surface waters are generally less than 1 mg B/L. Laboratory studies on the toxicity of freshwater fish were determined using early life (embryo-larval) stages in natural water and BOROSET V as a test substance. The results were:

Rainbow Trout (<i>S. gairdneri</i>)
24-day LC ₅₀ =150.0 mg B/L
36-day NOEC•LOEC=0.75-1 mg B/L
Goldfish (<i>Carassius auratus</i>)
7-day NOEC•LOEC=26.50 mg B/L
3-day LC ₅₀ =178 mg B/L

Invertebrate Toxicity: The acute toxicity (48-hour LC₅₀) to Daphnids (*Daphnia magna* Straus) in natural water is reported to be 133 mg B/L (added as BOROSET V. Estimated chronic toxicity (21-day NOEC•LOEC) values of 6-13 mg B/L (added as BOROSET V have also

ENVIRONMENTAL FATE DATA:

Persistence/Degradation: Boron and boron containing compounds, such as Boroset V, are naturally occurring and ubiquitous in the environment. In the presence of water, sodium polyborate disassociates into natural borates and boric acid

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

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NOTE: Boron (B) is the element in BOROSET V which is used to characterize borate product ecological effects. To convert BOROSET V data to Boron (B), multiply by 0.1484.

DISPOSAL CONSIDERATIONS

Disposal Guidance: Small quantities of BOROSET V can usually be disposed of at Municipal Landfill sites. No special disposal treatment is required, but refer to state and local regulations for applicable site-specific requirements. Tonnage quantities of product are not recommended to be sent to landfills. Such product should, if possible, be re-used for an appropriate application.

RCRA (40 CFR 261): BOROSET V is not listed under any sections of the Federal Resource Conservation and Recovery Act (RCRA).

California Hazardous Waste Designation: California identifies substances with acute LD₅₀'s less than 5000 mg/kg as "hazardous wastes". BOROSET V is therefore a "hazardous waste" if spilled in California, and should be handled in accordance with applicable state regulations. Refer to Regulatory Information for additional information

TRANSPORT INFORMATION

DOT Hazardous Material Classification: BOROSET V is not a U.S. Department of Transportation (DOT) Hazardous Material.

DOT Hazardous Substance Classification: BOROSET V is not a DOT Hazardous Substance.

International Transportation: BOROSET V has no U.N. Number, and is not regulated under international rail, highway, water, or air transport regulations.

REGULATORY INFORMATION

TSCA No.: BOROSET V does not appear on the EPA TSCA inventory list. BOROSET V does appear on the EPA TSCA inventory list (10043-35-3).

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

Superfund: CERCLA/SARA. BOROSET V is not listed under CERCLA (the Comprehensive Environmental Response Compensation and Liability Act) or its 1986 amendments, SARA, (the Superfund Amendments and Reauthorization Act), 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: BOROSET V 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.

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

- a.) BOROSET V is not itself a discharge covered by any water quality criteria of Section 304 of the CWA, 33USC1314
- 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.

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 Exposure Control/Personal Protection for regulatory exposure limits.

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

NTP Annual Report on Carcinogens: BOROSET V is not listed.

OSHA Carcinogen: BOROSET V is not listed.

California Proposition 65: BOROSET V is not listed on any Proposition 65 lists of carcinogens or reproductive toxicants.

OTHER INFORMATION

Product Label Text Hazard Information: Refer to EPA approved product label for additional product Hazard and Precautionary information.

National Fire Protection Association (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

Information presented herein has been compiled from sources considered dependable and is accurate and reliable to the best of our knowledge and belief, but it is not guaranteed to be so. Nothing herein is to be construed as recommending any practice or any product in violation of any law or regulation. It is the user's responsibility to determine the suitability of any material for a specific purpose and adopt necessary safety precautions. We make no warranty as to results to be obtained in using any material and, since conditions or use are not under our control, we must necessarily disclaim all liability with respect to use of any material supplied by us.