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## MATERIAL SAFETY DATA SHEET

### MSDS No: MSDS/ETH/FG-005

#### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Ethion Technical

**IUPAC Name:** O,O,O,O-tetraethyl S,S-methylene bis (phosphorodithioate)

**Manufacturer / Supplier** : Bharat Rasayan Limited  
1501, Vikram Tower, Rajendra Place,  
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#### 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Formula** : C<sub>9</sub>H<sub>22</sub>O<sub>4</sub>P<sub>2</sub>S<sub>4</sub>  
**Molecular Weight** : 384.5 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
<b>Ethion</b>			
563-12-2	209-242-3	015-047-00-2	95.00

### **3. HAZARDS IDENTIFICATION**

#### **EMERGENCY OVERVIEW**

**IMMEDIATE CONCERNS:** - Water-white to amber-colored liquid with a mercaptan or sulfur-like odor.

- Slightly combustible. May support combustion at elevated temperatures.
- Ethion may decompose rapidly and violently at temperatures above 150°C (302°F).
- Thermal decomposition and burning may form toxic by-products.
- For large exposures or fire, wear personal protective equipment.
- Highly toxic to fish and aquatic organisms. Keep out of drains and water courses.
- Highly toxic if swallowed. Moderately toxic if inhaled or absorbed through the skin.

**POTENTIAL HEALTH EFFECTS:** Effects from overexposure result from either swallowing, inhaling or absorption through

the skin. Symptoms of overexposure include headaches, weakness, abdominal cramps, nausea, excessive salivation, perspiration, blurred vision, tearing, pin-point pupils, convulsions, tremor and coma.

**MEDICAL CONDITIONS AGGRAVATED:** See "Notes to Medical Doctor" in Section 4 below.

#### 4. FIRST AID MEASURES

**EYES:** Flush with plenty of water. Get medical attention if irritation occurs and persists.

**SKIN:** Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

**INGESTION:** Drink 1 or 2 glasses of water and induce vomiting by touching the back of the throat with a finger or by giving syrup of ipecac. Never induce vomiting or give anything by mouth to an unconscious person. See a medical doctor.

**INHALATION:** Remove to fresh air. If breathing difficulty or discomfort occurs and persists, see a medical doctor. If breathing has stopped, give artificial respiration and see a medical doctor immediately.

**NOTES TO MEDICAL DOCTOR:** Ethion is highly toxic if swallowed and moderately toxic if inhaled or absorbed through the skin. It is non-irritating to the eyes. Atropine sulfate is antidotal. Support respiration as needed with removal of secretions, maintenance of a patent airway and, if necessary, artificial ventilation. If cyanosis is absent: Adults - start treatment by giving 2 mg atropine intravenously or intramuscularly, if necessary, and repeat with 0.4 - 2.0 mg atropine at 15 minute intervals until atropinization occurs (tachycardia, flushed skin, dry mouth, mydriasis); Children under 12 - initial dose = 0.05 mg/kg body weight and repeat dose = 0.02 - 0.05 mg/kg body weight. Start 2-PAM (Protopam®, Ayerst®) at the same time, following manufacturer's recommended dosages and administration. Morphine, reserpine, phenothiazines and theophylline are probably contraindicated. At first sign of pulmonary edema, the patient should be given supplemental oxygen and treated symptomatically. Observe patient to insure that these symptoms do not recur as atropinization wears off. If in eyes, instill one drop of homatropine. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care. Some individuals have a genetically determined low level of plasma pseudocholinesterase. These persons are particularly vulnerable to the action of the muscle-paralyzing drug succinylcholine, often administered to surgical patients. They may be unusually sensitive to organophosphate toxicity; this has not yet been proven. Patients with advanced liver disease, malnutrition, chronic alcoholism and dermatomyositis exhibit low plasma cholinesterase activities. Some cholinesterase depression may occur during early stages of pregnancy or with use of birth control pills.

## 5. FIRE FIGHTING MEASURES

**FLASH POINT AND METHOD:** 93°C (>200°F) (TOC)

**EXTINGUISHING MEDIA:** Foam, CO<sub>2</sub> or dry chemical. Soft stream water fog only if necessary. Contain all runoff.

**EXPLOSION HAZARDS:** Slightly combustible. This material may support combustion at elevated temperatures. Ethion may decompose rapidly and violently at temperatures above 150°F (302°C).

**FIRE FIGHTING PROCEDURES:** Isolate fire area. Evacuate downwind. Wear full protective clothing and self-contained breathing apparatus. Do not breathe smoke, gases or vapors generated.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Oxides of sulfur and phosphorus, mercaptans, carbon monoxide, carbon dioxide.

## 6. ACCIDENTAL RELEASE MEASURES

**RELEASE NOTES:** Isolate and post spill area. Wear protective clothing and personal protective equipment as prescribed in Section 8, "Exposure Controls/Personal Protection". Keep unprotected persons and animals out of the area.

Keep material out of lakes, streams, ponds and sewer drains. Dike to confine spill and absorb with a non-combustible absorbent such as clay, sand or soil. Vacuum, shovel or pump waste into a drum and label contents for disposal.

To clean and neutralize spill area, tools and equipment, wash with a suitable solution (i.e., bleach or caustic/soda ash and either ethylene glycol or an appropriate alcohol, i.e., methanol, ethanol or isopropanol). Follow this by washing with a strong soap and water solution. Absorb as above, any excess liquid and add to the drums of waste already collected. Repeat if necessary.

## 7. HANDLING AND STORAGE

**GENERAL PROCEDURES:** Store in a cool, dry, well-ventilated place. Do not use or store near heat, open flame or hot surfaces. Store in original containers only. Keep out of reach of children and animals. Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**ENGINEERING CONTROLS:** Use local exhaust at all process locations where vapor or mist may be emitted. Ventilate all transport vehicles prior to unloading.

### PERSONAL PROTECTIVE EQUIPMENT

**EYES AND FACE:** For splash, mist or spray exposure, wear chemical protective goggles or a face shield.

**RESPIRATORY:** For splash, mist or spray exposure wear, as a minimum, a properly fitted half-face or full-face air-purifying respirator which is approved for pesticides (U.S. NIOSH/MSHA, EU CEN or comparable certification organization). Respirator use and selection must be based on airborne concentrations.

**PROTECTIVE CLOTHING:** Depending upon concentrations encountered, wear coveralls or long-sleeved uniform and head covering. For larger exposures as in the case of spills, wear full body cover barrier suit, such as a PVC suit. Leather items - such as shoes, belts and watchbands - that become contaminated should be removed and destroyed. Launder all work clothing before reuse (separately from household laundry).

**WORK HYGIENIC PRACTICES:** Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking or using tobacco. Shower at the end of the workday.

### GLOVES:

Wear chemical protective gloves made of materials such as nitrile, neoprene or Viton® brand. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**ODOR:** Mercaptan or sulfur-like

**APPEARANCE:** Water-white to amber-colored liquid

**PERCENT VOLATILE:** 0.5% w/w (maximum)

**VAPOR PRESSURE:**  $1.5 \times 10^{-6}$  mmHg @ 25°C

**BOILING POINT:** 164°C (327°F)

**MELTING POINT:** -12 to -15°C

**SOLUBILITY IN WATER:** 2 ppm @ 20°C

**SPECIFIC GRAVITY:** 1.215 - 1.230 @ 20°C (water = 1)

**MOLECULAR WEIGHT:** 384.48 (ethion)

**WEIGHT PER VOLUME:** 10.1 - 10.2 lb/gal. (1215 - 1230 g/L)

## 10 Stability and Reactivity

**CONDITIONS TO AVOID:** Excessive heat and fire.

**STABILITY:** Stable

**POLYMERIZATION:** Will not occur

## 11. TOXICOLOGICAL INFORMATION

**DERMAL LD<sub>50</sub>:** 1084 mg/kg (rabbit)

**ORAL LD<sub>50</sub>:** 47 mg/kg (rat)

**INHALATION LC<sub>50</sub>:** 0.45 mg/L/4 hr (rat)

**ACUTE EFFECTS FROM OVEREXPOSURE:** Ethion is highly toxic if swallowed and moderately toxic if inhaled or absorbed through the skin. It is non-irritating to the eyes. Ethion is a cholinesterase-inhibiting pesticide which elicits symptoms in humans typical of cholinesterase inhibition including headaches, light-headedness, weakness, abdominal cramps, nausea, excessive salivation, perspiration, and blurred vision. More severe signs of cholinesterase inhibition include tearing, pin-point pupils, excessive respiratory secretions, cyanosis, convulsions, generalized tremor and coma. Excessive cholinesterase inhibition can result in death. Reductions of blood acetylcholinesterase levels can occur without symptoms of toxicity.

**CHRONIC EFFECTS FROM OVEREXPOSURE:** In studies with laboratory animals, ethion did not cause reproductive toxicity, teratogenicity, or carcinogenicity. Chronic exposure of laboratory animals to ethion caused decreased erythrocyte and plasma cholinesterase activity levels. An overall absence of genotoxicity has been demonstrated in mutagenicity testing with ethion.

### CARCINOGENICITY:

IARC: Not listed

NTP: Not listed

OSHA: Not listed

OTHER: (ACGIH) Not listed

## 12. ECOLOGICAL INFORMATION

**ENVIRONMENTAL DATA:** Ethion, under agricultural use conditions, has a moderate rate of degradation in soil (half-life roughly 90 days), but is dependent on soil type and pH. Ethion is not mobile in soil and is unlikely to leach into ground water. Ethion is susceptible to hydrolysis in alkaline waters. It has a moderate bioaccumulation potential (BCF = 1500) and may concentrate in the environment.

**ECOTOXICOLOGICAL INFORMATION:** Ethion is considered highly toxic to fish and aquatic arthropods with 96 hour LC50 values of 15 - 49 µg/L. It is only slightly toxic to shellfish (EC50 - 2.3 mg/L). Care should be taken to avoid contamination of the aquatic environment. Ethion is considered moderately toxic to upland game birds (oral LD50 = 128 mg/kg, bobwhite quail), but is only very slightly toxic to water fowl (oral LD50 > 2000 mg/kg).

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## 13. DISPOSAL CONSIDERATIONS

**DISPOSAL METHOD:** Open dumping or burning of this material or its packaging is prohibited. If spilled material cannot be disposed of by use according to label instructions, an acceptable method of disposal is to incinerate in accordance with local, state and national environmental laws, rules, standards and regulations. However, because acceptable methods of disposal may vary by location, and regulatory requirements may change, the appropriate agencies should be contacted prior to disposal.

**EMPTY CONTAINER:** Non-returnable containers which held this material should be cleaned, prior to disposal, by triple rinsing. Containers which held this material may be cleaned by being triple-rinsed, and recycled, with the rinsate being

## 14. TRANSPORT INFORMATION

### U.S. DOT (DEPARTMENT OF TRANSPORTATION)

**PROPER SHIPPING NAME:** Organophosphorus pesticides, liquid, toxic, n.o.s.

**TECHNICAL NAME:** Ethion

**PRIMARY HAZARD CLASS/DIVISION:** 6.1

**UN/NA NUMBER:** UN3018

**PACKING GROUP:** II

**REPORTABLE QUANTITY (RQ):** Listed (ethion > 1 gallon)

**U.S. SURFACE FREIGHT CLASS:** Insecticides, NOI, Poison other than Class A Poison. NMFC Item 102100.

**MARINE POLLUTANT #1:** ethion (Severe Marine Pollutant)

**NAERG:** 152

## 15. REGULATORY INFORMATION

### UNITED STATES

#### SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

**311 HAZARD CATEGORIES (40 CFR 370):** Immediate, Delayed

**SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):** The threshold planning quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs. This product contains the following ingredients with a TPQ of less than 10,000 lbs.: 1000 ethion (1000 lbs.)

**SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):** There are no ingredients in this product which are subject to Section 313 reporting requirements.

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):** Ethion

**SECTION 302.4 REPORTABLE QUANTITY (40 CFR 355)**

## **16. OTHER INFORMATION**

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**Prepared by: Bharat Rasayan Limited: EHS Department**

**Issue Date: 14/05/2012.**