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## Material Safety Data Sheet

### Triisopropyl borate MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Triisopropyl borate

**CAS#:** 5419-55-6

**RTECS:** Not applicable.

**TSCA:** Not applicable.

**CI#:** Not applicable.

**Synonym:** Triisopropoxyborane

**Chemical Name:** Triisopropyl borate

**Chemical Formula:** C<sub>9</sub>H<sub>21</sub>BO<sub>3</sub>

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#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS # %	By Weight
Triisopropyl borate	5419-55-6	≥ 100.0%

**Toxicological Data on Ingredients:** Not applicable.

#### Section 3: Hazards Identification

Appearance: colorless clear liquid. Flash Point: 17 deg C.

**Danger!** Highly flammable. May cause eye, skin, and respiratory tract irritation. May cause central nervous system depression. May cause cardiac disturbances. May cause liver and kidney damage. Moisture sensitive.

**Target Organs:** Kidneys, central nervous system, liver, cardiovascular system.

**Potential Health Effects Eye:** May

cause eye irritation.

**Skin:** May cause irritation and dermatitis.

**Ingestion:** May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause cardiac disturbances. Ingestion of large amounts may cause CNS depression.

**Inhalation:** May cause respiratory tract irritation. May cause liver and kidney damage. Aspiration may lead to pulmonary edema. Vapors may cause dizziness or suffocation. May cause cardiac abnormalities. Inhalation at high concentrations may cause CNS depression and asphyxiation. May cause burning sensation in the chest.

**Chronic:** May cause liver and kidney damage. Effects may be delayed.

#### Section 4: First Aid Measures

**Eyes:** Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**Skin:** Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

**Ingestion:** Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

**Inhalation:** Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

**Notes to Physician:** Treat symptomatically and supportively.

#### Section 5: Fire and Explosion Data

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Containers may explode in the heat of a fire. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Will be easily ignited by heat, sparks or flame.

**Extinguishing Media:** For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Water may be ineffective. Water may spread fire. If water is the only media available, use in flooding amounts. Do NOT get water inside containers. Do NOT use straight streams of water. Cool containers with flooding quantities of water until well after fire is out.

**Flash Point:** 17 deg C ( 62.60 deg F)

**Autoignition Temperature:** Not applicable.

**Explosion Limits, Lower:**Not available.

**Upper:** Not available.

**NFPA Rating:** (estimated) Health: 3; Flammability: 3; Instability: 1

#### Section 6: Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.  
**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. Do not get water inside containers. A vapor suppressing foam may be used to reduce vapors.

### Section 7: Handling and Storage

**Handling:** Wash thoroughly after handling. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid breathing dust, mist, or vapor. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not allow contact with water. Use only in a chemical fume hood. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Keep from contact with moist air and steam. **Storage:** Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep under a nitrogen blanket. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Store protected from moisture.

### Section 8: Exposure Controls/Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

**Exposure Limits**

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Triisopropyl borate	none listed	none listed	none listed

**OSHA Vacated PELs:** Triisopropyl borate: No OSHA Vacated PELs are listed for this chemical.

**Personal Protective Equipment Eyes:** Wear

chemical splash goggles.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149.

Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

### Section 9: Physical and Chemical Properties

**Physical State:** Clear liquid  
**Appearance:** colorless  
**Odor:** Not available.  
**pH:** Not available.  
**Vapor Pressure:** 76 mm Hg @75 deg C  
**Vapor Density:** 6.5  
**Evaporation Rate:**Not available.  
**Viscosity:** Not available.  
**Boiling Point:** 139 - 141 deg C @ 760mmHg  
**Freezing/Melting Point:**-59 deg C  
**Decomposition Temperature:**Not available.  
**Solubility:** may decompose in water  
**Specific Gravity/Density:**.8150g/cm3  
**Molecular Formula:**?CH3)2CHO!3B  
**Molecular Weight:**188.07

## Section 10: Stability and Reactivity Data

**Chemical Stability:** Stable under normal temperatures and pressures. May decompose on exposure to moist air or water.

**Conditions to Avoid:** Ignition sources, moisture, excess heat, exposure to moist air or water.

**Incompatibilities with Other Materials:** Strong oxidizing agents.

**Hazardous Decomposition Products:** Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, oxides of boron.

**Hazardous Polymerization:** Will not occur.

## Section 11: Toxicological Information

**RTECS#:**

**CAS#** 5419-55-6: ED5950000

**LD50/LC50:**

**CAS#** 5419-55-6:

Draize test, rabbit, eye: 100 mg Mild;

Oral, mouse: LD50 = 2500 mg/kg;

**Carcinogenicity:**

**CAS#** 5419-55-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** No information found

**Teratogenicity:** No information found

**Reproductive Effects:** No information found

**Mutagenicity:** No information found

**Neurotoxicity:** No information found

**Other Studies:**

## Section 12: Ecological Information

No information available.

## Section 13: Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** None listed.

## Section 14: Transport Information

**Shipping Name:** TRIISOPROPYL BORATE

**Hazard Class:** 3

**UN Number:** UN2616

**Packing Group:** II

**Additional Info:**

## Section 15: Other Regulatory Information

### US FEDERAL

#### TSCA

CAS# 5419-55-6 is listed on the TSCA inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

#### CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

#### SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

**Section 313** No chemicals are reportable under Section 313.

#### Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

#### Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

#### OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

#### STATE

CAS# 5419-55-6 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

#### California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations**

**European Labeling in Accordance with EC Directives**

**Hazard Symbols:**

F

**Risk Phrases:**

R 11 Highly flammable.

**Safety Phrases:**

S 16 Keep away from sources of ignition - No smoking. S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges. S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 9 Keep container in a well-ventilated place.

S 28A After contact with skin, wash immediately with plenty of water

**WGK (Water Danger/Protection)**

CAS# 5419-55-6: No information available.

**Canada - DSL/NDSL**

CAS# 5419-55-6 is listed on Canada's NDSL List.

**Canada - WHMIS**

This product has a WHMIS classification of B2, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

**Canadian Ingredient Disclosure List**

**Section 16: Other Information**

**References:** Not available.

**Other Special Considerations:** Not available.

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