SECTION 1: Identification

1.1. Product identifier

Product name: TRIS(PENTAFLUOROPHENYL)BORON, 10% in toluene
Product code: OMBO087.4
Product form: Mixture
Physical state: Liquid
Formula: C18BF15
Synonyms: PENTAFLUOROPHENYLBORANE; TRIS(PENTAFLUOROPHENYL)BORANE
Chemical family: BORON COMPOUND

1.2. Recommended use of the chemical and restrictions on use

Recommended use: Chemical intermediate
For research and industrial use only

1.3. Details of the supplier of the safety data sheet

GELEST, INC.
11 East Steel Road
Morrisville, PA 19067
USA
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST
info@gelest.com - www.gelest.com

1.4. Emergency telephone number

Emergency number: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification
Flammable liquids Category 2 H225
Acute toxicity (oral) Category 4 H302
Skin corrosion/irritation Category 2 H315
Serious eye damage/eye irritation Category 2A H319
Reproductive toxicity Category 2 H361
Specific target organ toxicity (single exposure) Category 3 H336
Specific target organ toxicity (repeated exposure) Category 2 H373
Hazardous to the aquatic environment - Acute Hazard Category 3 H402
Full text of H statements: see section 16

2.2. Label elements

GHS-US labeling
Hazard pictograms (GHS-US): 
   ![Hazard pictograms]

Signal word (GHS-US): Danger
Hazard statements (GHS-US): H225 - Highly flammable liquid and vapor
H302 - Harmful if swallowed
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H336 - May cause drowsiness or dizziness
H361 - Suspected of damaging fertility or the unborn child
H373 - May cause damage to organs through prolonged or repeated exposure
H402 - Harmful to aquatic life

Precautionary statements (GHS-US): P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P260 - Wear protective gloves/protective clothing/eye protection/face protection
P210 - Keep away from heat, open flames, sparks. - No smoking
P240 - Ground/Bond container and receiving equipment
P241 - Use explosion-proof electrical equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
### 2.3. Hazards not otherwise classified (HNOC)

No additional information available.

### 2.4. Unknown acute toxicity (GHS US)

No data available.

### SECTION 3: Composition/Information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tris(pentafluorophenyl)boron</td>
<td>(CAS No) 1109-15-5</td>
<td>8 - 12</td>
<td>Acute Tox. 3 (Oral), H301, Eye Irrit. 2A, H319</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements: see section 16

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

**First-aid measures general**: Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.

**First-aid measures after inhalation**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

**First-aid measures after skin contact**: Wash with plenty of soap and water. Get medical advice/attention.

**First-aid measures after eye contact**: Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.

**First-aid measures after ingestion**: Never give anything by mouth to an unconscious person. Immediately call a poison center or doctor/physician.

#### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/injuries**: May cause damage to organs.

**Symptoms/injuries after inhalation**: May cause drowsiness or dizziness. May cause irritation to the respiratory tract. Overexposure may cause: Coughing. Headache. Nausea.

**Symptoms/injuries after skin contact**: Causes skin irritation.

**Symptoms/injuries after eye contact**: Causes serious eye irritation.

**Symptoms/injuries after ingestion**: Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

#### 4.3. Indication of any immediate medical attention and special treatment needed

No additional information available.
SECTION 5: Firefighting measures

5.1. Extinguishing media
Unsuitable extinguishing media: None known.

5.2. Special hazards arising from the substance or mixture
Fire hazard: Highly flammable liquid and vapor. Irritating fumes and organic acid vapors may develop when material is exposed to water or open flame.
Explosion hazard: May form flammable/explosive vapor-air mixture.

5.3. Advice for firefighters
Firefighting instructions: Use water spray to cool exposed surfaces. Exercise caution when fighting any chemical fire.
Protection during firefighting: Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
General measures: Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel
Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders
Protective equipment: Equip cleanup crew with proper protection.

6.2. Environmental precautions
Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up
Methods for cleaning up: Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. Use only non-sparking tools.

6.4. Reference to other sections
See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Additional hazards when processed: Handle empty containers with care because residual vapors are flammable.
Precautions for safe handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid all eye and skin contact and do not breathe vapor and mist. Provide good ventilation in process area to prevent accumulation of vapors. Take precautionary measures against static discharge. Use only non-sparking tools. Containers must be properly grounded before beginning transfer. Use only in well ventilated areas.
Hygiene measures: Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities
Technical measures: Ground/bond container and receiving equipment. Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.
Storage conditions: Keep container tightly closed.
Storage area: Store in a well-ventilated place. Store away from heat.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th></th>
<th>ACGIH TWA (ppm)</th>
<th>OSHA PEL (TWA) (ppm)</th>
<th>OSHA PEL (Ceiling) (ppm)</th>
<th>US IDLH (ppm)</th>
<th>NIOSH REL (TWA) (mg/m³)</th>
<th>NIOSH REL (TWA) (ppm)</th>
<th>NIOSH REL (STEL) (mg/m³)</th>
<th>NIOSH REL (STEL) (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene (108-88-3)</td>
<td>20 ppm</td>
<td>200 ppm</td>
<td>300 ppm</td>
<td>500 ppm</td>
<td>375 mg/m³</td>
<td>100 ppm</td>
<td>560 mg/m³</td>
<td>150 ppm</td>
</tr>
<tr>
<td>ACGIH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSHA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8.2. Exposure controls

Appropriate engineering controls: Provide local exhaust or general room ventilation.

Personal protective equipment: Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection: Neoprene or nitrile rubber gloves.

Eye protection: Chemical goggles. Contact lenses should not be worn.

Skin and body protection: Wear suitable protective clothing.

Respiratory protection: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified combination organic vapor/acid gas (yellow cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Liquid

Appearance: Liquid

Molecular mass: 511.99 g/mol

Color: Straw. Yellow

Odor: No data available

Odor threshold: No data available

Refractive index: 1.493

pH: No data available

Relative evaporation rate (butyl acetate=1): No data available

Melting point: No data available

Freezing point: No data available

Boiling point: 110 °C initial (toluene)

Flash point: 4 °C

Auto-ignition temperature: 536 °C

Decomposition temperature: No data available

Flammability (solid, gas): Highly flammable liquid and vapor

Vapor pressure: No data available

Relative vapor density at 20 °C: No data available

Relative density: 0.899

VOC content: < 1 %

Solubility: Insoluble in water.

Log Pow: No data available

Log Kow: No data available

Viscosity, kinematic: No data available

Viscosity, dynamic: No data available

Explosive properties: No data available

Oxidizing properties: No data available

Explosion limits: 1.27 - 7 vol % (toluene); (lower; upper)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable in sealed containers.

10.3. Possibility of hazardous reactions

Caution: Explosions have been reported when mixed with trialkylaluminum compounds.

10.4. Conditions to avoid

No additional information available

10.5. Incompatible materials

Oxidizing agent. Strong acids.
TRIS(PENTAFLUOROPHENYL)BORON, 10% in toluene
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10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity: Oral: Harmful if swallowed.

TRIS(PENTAFLUOROPHENYL)BORON, 10% in toluene (1109-15-5)
ATE US (oral) 833.33 mg/kg body weight

Tris(pentafluorophenyl)boron (1109-15-5)
LD50 oral rat 100 - 150 mg/kg
ATE US (oral) 100.000 mg/kg body weight

Toluene (108-88-3)
LD50 oral rat 2600 mg/kg
LD50 dermal rabbit 12000 mg/kg
LC50 inhalation rat (mg/l) 12.5 mg/l/4h

Skin corrosion/irritation: Causes skin irritation.
Serious eye damage/irritation: Causes serious eye irritation.
Rabbit eye - non-irritating
Respiratory or skin sensitization: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified
None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

Toluene (108-88-3)
IARC group 3 - Not classifiable
Reproductive toxicity: Suspected of damaging fertility or the unborn child.
Specific target organ toxicity (single exposure): May cause drowsiness or dizziness.
Specific target organ toxicity (repeated exposure): May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard: Not classified
Symptoms/injuries after inhalation: May cause drowsiness or dizziness. May cause irritation to the respiratory tract. Overexposure may cause: Coughing. Headache. Nausea.
Symptoms/injuries after skin contact: Causes skin irritation.
Symptoms/injuries after eye contact: Causes serious eye irritation.
Symptoms/injuries after ingestion: Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.
Reason for classification: Expert judgment

SECTION 12: Ecological information

12.1. Toxicity
Toluene (108-88-3)
LC50 fish 1 15.22 - 19.05 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1 5.46 - 9.83 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC50 fish 2 12.6 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Daphnia 2 11.5 mg/l (Exposure time: 48 h - Species: Daphnia magna)

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
Toluene (108-88-3)
Log Pow 2.65

12.4. Mobility in soil
No additional information available

12.5. Other adverse effects
Other adverse effects: This substance may be hazardous to the environment.
Effect on ozone layer: No additional information available
TRIS(PENTAFLUOROPHENYL)BORON, 10% in toluene
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### Effect on the global warming
- No known effects from this product.

### GWPmix comment
- No known effects from this product.

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewage disposal recommendations</td>
<td>Do not dispose of waste into sewer.</td>
</tr>
<tr>
<td>Waste disposal recommendations</td>
<td>May be incinerated. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.</td>
</tr>
<tr>
<td>Ecology - waste materials</td>
<td>Avoid release to the environment.</td>
</tr>
</tbody>
</table>

### SECTION 14: Transport information

#### 14.1. UN number
- UN-No.(DOT): 1992
- DOT NA no.: UN1992

#### 14.2. UN proper shipping name

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport document description</td>
<td>UN1992 Flammable liquids, toxic, n.o.s. (TRIS(PENTAFLUOROPHENYL)BORON, 10% in toluene), 3, II</td>
</tr>
<tr>
<td>Proper Shipping Name (DOT)</td>
<td>Flammable liquids, toxic, n.o.s. (TRIS(PENTAFLUOROPHENYL)BORON, 10% in toluene)</td>
</tr>
<tr>
<td>Class (DOT)</td>
<td>3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120</td>
</tr>
<tr>
<td>Packing group (DOT)</td>
<td>II - Medium Danger</td>
</tr>
<tr>
<td>Hazard labels (DOT)</td>
<td>3 - Flammable liquid</td>
</tr>
<tr>
<td></td>
<td>6.1 - Poison</td>
</tr>
</tbody>
</table>

|DOT Packaging Non Bulk (49 CFR 173.xxx)| 202 |
|DOT Packaging Bulk (49 CFR 173.xxx)| 243 |
|DOT Packaging Exceptions (49 CFR 173.xxx)| 150 |
|DOT Symbols| G - Identifies PSN requiring a technical name |

#### 14.3. Additional information
- Other information: No supplementary information available.

**Transport by sea**
- DOT Vessel Stowage Location: B - (i) The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) “On deck only” on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded
- DOT Vessel Stowage Other: 40 - Stow “clear of living quarters”

**Air transport**
- DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27): 1 L
- DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75): 60 L

### SECTION 15: Regulatory information

#### 15.1. US Federal regulations

<table>
<thead>
<tr>
<th>Substance</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tris(pentafluorophenyl)boron (1109-15-5)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td>Toluene (108-88-3)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td></td>
<td>Subject to reporting requirements of United States SARA Section 313</td>
</tr>
<tr>
<td>SARA Section 313 - Emission Reporting</td>
<td>1.0 %</td>
</tr>
</tbody>
</table>
TRIS(PENTAFLUOROPHENYL)BORON, 10% in toluene
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15.2. International regulations

CANADA

Tris(pentafluorophenyl)boron (1109-15-5)
Listed on the Canadian NDSL (Non-Domestic Substances List)

Toluene (108-88-3)
Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification
Class B Division 2 - Flammable Liquid
Class D Division 2 Subdivision A - Very toxic material causing other toxic effects
Class D Division 2 Subdivision B - Toxic material causing other toxic effects

EU-Regulations
No additional information available

Toluene (108-88-3)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Tris(pentafluorophenyl)boron (1109-15-5)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ISHL (Industrial Safety and Health Law)

Toluene (108-88-3)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Poisonous and Deleterious Substances Control Law
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSO (Mexican National Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

15.3. US State regulations

Toluene (108-88-3)
U.S. - California - Proposition 65 - Carcinogens List
U.S. - California - Proposition 65 - Developmental Toxicity
U.S. - California - Proposition 65 - Reproductive Toxicity - Female
U.S. - California - Proposition 65 - Reproductive Toxicity - Male
Non-significant risk level (NSRL)

<table>
<thead>
<tr>
<th></th>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
<th>U.S. - California - Proposition 65 - Developmental Toxicity</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</th>
<th>Non-significant risk level (NSRL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Toluene (108-88-3)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Full text of H-phrases:

- H225: Highly flammable liquid and vapor
- H301: Toxic if swallowed
- H302: Harmful if swallowed
- H304: May be fatal if swallowed and enters airways
- H315: Causes skin irritation
- H319: Causes serious eye irritation
- H336: May cause drowsiness or dizziness
- H361: Suspected of damaging fertility or the unborn child
- H373: May cause damage to organs through prolonged or repeated exposure
- H402: Harmful to aquatic life
TRIS(PENTAFLUOROPHENYL)BORON, 10% in toluene
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Abbreviations and acronyms:
- Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling.

HMIS III Rating

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given</td>
</tr>
<tr>
<td>Flammability</td>
<td>3 Serious Hazard - Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 F and boiling points above 100 F, as well as liquids with flash points between 73 F and 100 F. (Classes IB &amp; IC)</td>
</tr>
<tr>
<td>Physical</td>
<td>0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives</td>
</tr>
</tbody>
</table>

Prepared by safety and environmental affairs.

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SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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