1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product code: T1595
Product Name: TRIMETHYL PHOSPHITE
Chemical Name: Phosphorous acid, trimethyl ester

Synonyms:
- TRIMETHOXYSFOSFIN
- TRIMETHOXYPHOSPHINE
- TRIMETHYLFOSFIT
- Phosphite triméthylique (French)

Recommended use: Chemical intermediate. In inorganic synthesis.

CAS #: 121-45-9
Formula: C3-H9-O3-P
RTECS #: TH1400000
CI#: Not available

Supplier: Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Emergency Telephone Number:
- CHEMTREC: 1-800-424-9300

Contact Person:
- Martin LaBenz (West Coast)
- Chris Terpak (East Coast)

2. HAZARDS IDENTIFICATION

DANGER FLAMMABLE! WARNING! IRRITANT. Irritating to eyes. Irritating to skin. Irritating to respiratory system.

Physical state: Liquid.
Appearance: No information available
Color: Colorless.

OSHA Regulatory Status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)
2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:
Ingestion. Skin. Eyes. Inhalation.

Acute Potential Health Effects:

Skin Contact:
Irritating to skin. It may be absorbed through the skin. If absorbed through skin it may cause systemic effects with symptoms similar to those of ingestion. If absorbed through the skin it may affect behavior/central nervous system and cause central nervous system effects.

Eye Contact:
Causes eye irritation.

Inhalation:
Irritating to respiratory system.

Ingestion:
May cause central nervous system effects. May affect respiration. May affect the liver.

Chronic Potential Health Effects:

Target Organs: No information available
Carcinogen Status: No information available
Mutagenic Effects: May affect genetic material
Mutagenic effects in mammalian somatic cells
Teratogenic Effects: May cause birth defects (teratogenic effects) based on animal test data
Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trimethyl Phosphite</td>
<td>121-45-9</td>
<td>100</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention. If skin irritation persists, call a physician.

Eye Contact: Flush eye with water for 15 minutes. Get medical attention.
Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

Notes to Physician: Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashpoint (°C/°F)</td>
<td>28 °C/82 °F</td>
</tr>
<tr>
<td></td>
<td>54 °C/130 °F</td>
</tr>
</tbody>
</table>

Tested according to:
- Closed cup
- Open cup

Lower Explosion Limit (%): No information available
Upper Explosion Limit (%): No information available

Autoignition Temperature (°C/°F): Not applicable.

Suitable Extinguishing Media: Carbon dioxide (CO2), Dry chemical. Water spray mist or foam.

Unsuitable Extinguishing Media: Do not use a solid (straight) water stream as it may scatter and spread fire.

Hazardous Combustion Products: Carbon monoxide; Carbon dioxide; Phosphorus oxides and/or phosphine

Specific hazards: Flammable. May be ignited by heat, sparks or flames. Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Container explosion may occur under fire conditions or when heated. Fire may produce irritating, corrosive and/or toxic gases.

Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

Specific Methods: Water mist may be used to cool closed containers. For fires involving tanks or car/trailer loads, cool containers with flooding quantities of water until well after the fire is out.

6. ACCIDENTAL RELEASE MEASURES

Product code: T1595
Product name: TRIMETHYL PHOSPHITE
Personal Precautions:
Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Remove all sources of ignition. Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. In case of large spill, water spray or vapor suppressing foam may be used to reduce vapors, but may not prevent ignition in closed spaces.

Environmental Precautions:
Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas. In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

Methods for Cleaning Up:
Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical Measures/Precautions:
Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice:
Wear personal protective equipment. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not breathe vapors or spray mist. Do not ingest. When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical Measures/Storage Conditions:
Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Keep away from heat and sources of ignition. Store in a segregated and approved area. Store away from incompatible materials.

Incompatible Products:
Oxidizing agents. Water.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:
Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Personal Protective Equipment

Eye protection: Goggles. Safety glasses with side-shields.
Skin and body protection: Chemical resistant apron. Long sleeved clothing. Gloves.
Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent.
Hygiene measures: Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

National occupational exposure limits

Product code: T1595  Product name: TRIMETHYL PHOSPHITE
### United States

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
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<tbody>
<tr>
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<td>2 ppm TWA</td>
<td>2 ppm TWA</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 mg/m³ TWA</td>
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### Canada

<table>
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<tr>
<th>Components</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Quebec</th>
<th>Ontario</th>
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<tr>
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<td>2 ppm TWA</td>
<td>2 ppm TWAEV</td>
<td>2 ppm TWA</td>
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<td></td>
<td>10 mg/m³ TWA</td>
<td></td>
<td>10 mg/m³ TWAEV</td>
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### Australia and Mexico

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<th>Mexico</th>
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<tr>
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<td>2 ppm TWA</td>
</tr>
<tr>
<td></td>
<td>10 mg/m³ TWA</td>
<td>10 mg/m³ TWA</td>
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<tr>
<td></td>
<td></td>
<td>5 ppm STEL</td>
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<tr>
<td></td>
<td></td>
<td>25 mg/m³ STEL</td>
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</tbody>
</table>

### 9. PHYSICAL AND CHEMICAL PROPERTIES

- **Physical state:** Liquid.
- **Odor:** Pungent. Powerful. Irritating.
- **Flash point (°C):** 28
- **Autoignition Temperature (°C/°F):** No information available
- **Melting point/range(°C/°F):** -78 °C/-108.4 °F
- **Density (g/cm³):** No information available
- **Vapor density:** 4.3
- **Odor threshold (ppm):** No information available

#### Appearance:
- No information available

#### Color:
- Colorless.

#### Molecular/Formula weight:
- 124.08

#### Boiling point/range(°C/°F):
- 111-112 °C/231.8-233.6 °F

#### Specific gravity:
- 1.046 to 1.0520 @ 20 °C

#### Vapor pressure @ 20°C (kPa):
- 2.26

#### VOC content (g/L):
- No information available

#### Miscibility:
- No information available

### 10. STABILITY AND REACTIVITY

- **Stability:** Stable at normal conditions
- **Conditions to avoid:** Heat. Ignition sources. Incompatible materials.

**Product code:** T1595

**Product name:** TRIMETHYL PHOSPHITE
Materials to avoid: Oxidising agents. Water.

Hazardous decomposition products: Carbon monoxide. Carbon dioxide. Phosphorus oxides and/or phosphine. When heated to decomposition it emits toxic fumes.

Possibility of Hazardous Reactions: Contact between magnesium perchlorate & trimethyl phosphite can cause violent explosions.

Polymerization: Hazardous polymerisation does not occur

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

Trimethyl Phosphite - 121-45-9

LD50/oral/rat = 1600 mg/kg Oral LD50 Rat
LD50/oral/mouse = 4280 mg/kg
LD50/dermal/rabbit = 2600 mg/kg Dermal LD50 Rabbit
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 information = No information available

Product Information

LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
LD50/dermal/rabbit = 2600 mg/kg
LD50/dermal/rat = No information available
LD50/oral/rat = 1600 mg/kg
LD50/oral/mouse = 4280 mg/kg

Local Effects

Skin irritation: Irritating to skin. Mild skin irritation. Severe skin irritation.

Eye irritation: Irritating to eyes. Mild eye irritation.

Inhalation: Irritating to respiratory system. Causes lacrimation. May affect respiration (respiratory depression). May affect behavior/central nervous system (somnolence).

Ingestion: May affect behavior/central nervous system (somnolence, ataxia). May affect behavior/central nervous system (convulsions). May affect respiration (respiratory depression). It may affect the spleen. May affect liver.

Sensitization: No information available

Chronic Toxicity

Product code: T1595

Product name: TRIMETHYL PHOSPHITE

6 / 10
Chronic Toxicity

Prolonged or repeated inhalation may cause emphysema. Prolonged or repeated inhalation may affect the kidneys. Prolonged or repeated ingestion may affect the liver. Prolonged or repeated exposure of eyes to vapor or mist may cause corneal damage. Chronic exposure may cause dermatitis. Prolonged or repeated ingestion may affect metabolism. Prolonged or repeated skin contact and absorption may affect the liver (hepatitis) and respiration (chronic pulmonary edema).

Carcinogenic effects:

May cause cancer based on animal test data. Tumorigenic agent by RTECS criteria.

<table>
<thead>
<tr>
<th>Components</th>
<th>NTP</th>
<th>IARC</th>
<th>OSHA</th>
<th>ACGIH - Carcinogens</th>
<th>Australia Prohibited Carcinogenic Substances</th>
<th>Australia Notifiable Carcinogenic Substances</th>
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<tbody>
<tr>
<td>Trimethyl Phosphite</td>
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<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
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</table>

Mutagenic Effects:

May affect genetic material
Mutagenic effects in mammalian somatic cells

Reproductive Effects:

No information available

Teratogenic Effects:

May cause birth defects (teratogenic effects) based on animal test data

Target Organs:

No information available

12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: No information available

Ecotoxicity effects: No data available

Aquatic toxicity: No information available

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trimethyl Phosphite</td>
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<td>None</td>
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</tbody>
</table>

14. TRANSPORT INFORMATION

DOT

UN-No: UN2329
Proper Shipping Name: Trimethyl phosphite
Hazard Class: 3
Packing Group: III

Product code: T1595  Product name: TRIMETHYL PHOSPHITE
<table>
<thead>
<tr>
<th>Field</th>
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<tbody>
<tr>
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<td>ERG No:</td>
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<td>DOT RQ (lbs):</td>
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<td>TDG (Canada) Proper Shipping Name:</td>
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<td>IMO / IMDG Proper Shipping Name:</td>
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<td>IMDG Marine Pollutant:</td>
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<td>EMS:</td>
<td>F-E</td>
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<td>MFAG:</td>
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<td>Maximum Quantity:</td>
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<tr>
<td>Product code: T1595</td>
<td>Product name: TRIMETHYL PHOSPHITE</td>
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</table>
15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>Philippines (PICCS)</th>
<th>KOREA KECL</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trimethyl Phosphite</td>
<td>Present</td>
<td>Present</td>
<td>KE-28707</td>
<td>2-1951</td>
<td>Present</td>
<td>Present</td>
<td>204-471-5</td>
</tr>
</tbody>
</table>

U.S. Regulations

Trimethyl Phosphite
- Massachusetts RTK: Present
- New Jersey RTK Hazard Substance: Present
- Pennsylvania RTK: Present
- RI RTK - Hazardous Substances List: Present
- Minnesota - Hazardous Substance List: Present
- California Directors List of Hazardous Substances: Present


Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Not Listed</td>
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</table>

CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
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<tbody>
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<td>None</td>
<td>None</td>
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</table>

U.S. TSCA

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) -Health and Safety Reporting</th>
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</thead>
<tbody>
<tr>
<td>Trimethyl Phosphite</td>
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<td>Not Applicable</td>
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Canada

WHMIS hazard class:
B2 Flammable liquid

Trimethyl Phosphite
B2

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.
Trimethyl Phosphite 10 / 10

Product code: T1595
Product name: TRIMETHYL PHOSPHITE

Components

<table>
<thead>
<tr>
<th>Components</th>
<th>WHMIS Ingredient Disclosure List -</th>
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<td>Trimethyl Phosphite</td>
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Inventory

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
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<tbody>
<tr>
<td>Trimethyl Phosphite</td>
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</tr>
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</table>

EU Classification

R-phrase(s)
R10 - Flammable.
R38 - Irritating to skin.

S-phrase(s)
S37 - Wear suitable gloves.

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
Flammable
Xi - Irritant.

16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1-2004 standards.

Preparation Date: 31-Mar-2011
Reason for revision: Not applicable
Prepared by: Sonia Owen

Literature reference: No information available

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.