1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Phosphorus trichloride

Product Number: 320463

Brand: Sigma-Aldrich

Supplier: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO  63103
USA

Telephone: +1 800-325-5832
Fax: +1 800-325-5052
Emergency Phone #: (314) 776-6555

Preparation Information: Sigma-Aldrich Corporation
Product Safety - Americas Region
1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Toxic by inhalation., Highly toxic by ingestion, Corrosive

GHS Classification
Acute toxicity, Inhalation (Category 2)
Acute toxicity, Oral (Category 2)
Skin corrosion (Category 1A)
Serious eye damage (Category 1)
Specific target organ toxicity - repeated exposure, Inhalation (Category 2)

GHS Label elements, including precautionary statements

Pictogram

Signal word: Danger

Hazard statement(s)
H300 + H330  Fatal if swallowed or if inhaled
H314  Causes severe skin burns and eye damage.
H373  May cause damage to organs through prolonged or repeated exposure if inhaled.

Precautionary statement(s)
P260  Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264  Wash hands thoroughly after handling.
P280  Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284  Wear respiratory protection.
P305 + P351 + P338  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310  Immediately call a POISON CENTER or doctor/ physician.

Other hazards
React violently with water., Contact with water liberates toxic gas.

HMIS Classification
Health hazard: 4
Flammability: 0
Physical hazards: 0

NFPA Rating
Health hazard: 4
Fire: 0
Reactivity Hazard: 0

Potential Health Effects
- **Inhalation**: Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
- **Skin**: May be harmful if absorbed through skin. Causes skin burns.
- **Eyes**: Causes eye burns. Causes severe eye burns.
- **Ingestion**: May be fatal if swallowed.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

- **Synonyms**: Phosphorus(III) chloride
- **Formula**: Cl\(_3\)P
- **Molecular Weight**: 137.33 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phosphorus trichloride</strong></td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>7719-12-2</td>
</tr>
<tr>
<td>EC-No.</td>
<td>231-749-3</td>
</tr>
<tr>
<td>Index-No.</td>
<td>015-007-00-4</td>
</tr>
</tbody>
</table>

### 4. FIRST AID MEASURES

- **General advice**: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
- **If inhaled**: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
- **In case of skin contact**: Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.
- **In case of eye contact**: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.
- **If swallowed**: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

### 5. FIREFIGHTING MEASURES

- **Conditions of flammability**: Not flammable or combustible.
- **Suitable extinguishing media**: Dry powder
- **Special protective equipment for firefighters**: Wear self contained breathing apparatus for fire fighting if necessary.
- **Hazardous combustion products**: Hazardous decomposition products formed under fire conditions. - Oxides of phosphorus, Hydrogen chloride gas

### 6. ACCIDENTAL RELEASE MEASURES
Personal precautions
Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Do not flush with water. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Never allow product to get in contact with water during storage.
Store under inert gas. Light sensitive. Metals

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus trichloride</td>
<td>7719-12-2</td>
<td>TWA</td>
<td>0.5 ppm</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td>TWA</td>
<td>0.2 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
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<tr>
<td></td>
<td></td>
<td>STEL</td>
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<td>USA. ACGIH Threshold Limit Values (TLV)</td>
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<tr>
<td></td>
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<td>TWA</td>
<td>0.2 ppm</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.5 mg/m³</td>
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</tr>
<tr>
<td></td>
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Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber  
Minimum layer thickness: 0.7 mm  
Break through time: 480 min  
Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash protection  
Material: Nitrile rubber  
Minimum layer thickness: 0.4 mm  
Break through time: 37 min  
Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection  
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection  
Complete suit protecting against chemicals, Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures  
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form liquid
Colour no data available

Safety data
pH no data available
Melting point/freezing point Melting point/range: -112 °C (-170 °F) - lit.
Boiling point 74 - 78 °C (165 - 172 °F) - lit.
Flash point not applicable
Ignition temperature no data available
Auto-ignition temperature no data available
Lower explosion limit no data available
Upper explosion limit no data available
Vapour pressure 167 hPa (125 mmHg) at 25 °C (77 °F)
133 hPa (100 mmHg) at 21 °C (70 °F)
Density 1.574 g/cm3 at 20 °C (68 °F)
Water solubility no data available
Partition coefficient: n-octanol/water no data available
Relative vapor density 4.74 - (Air = 1.0)
Odour no data available
Odour Threshold no data available
10. STABILITY AND REACTIVITY

**Chemical stability**
Stable under recommended storage conditions.

**Possibility of hazardous reactions**
Reacts violently with water.

**Conditions to avoid**
Exposure to moisture.

**Materials to avoid**
Strong bases, Sodium/sodium oxides, Strong oxidizing agents, Potassium, Ammonia, Alcohols, Dimethyl sulfoxide. (DMSO), Metals

**Hazardous decomposition products**
Hazardous decomposition products formed under fire conditions. - Oxides of phosphorus, Hydrogen chloride gas
Reacts with water to form: - hydrochloric acid, Phosphorus trihydride (phosphine)

11. TOXICOLOGICAL INFORMATION

**Acute toxicity**

**Oral LD50**
LD50 Oral - rat - 18 mg/kg

**Inhalation LC50**
LC50 Inhalation - rat - 4 h - 104 ppm

**Dermal LD50**
no data available

**Other information on acute toxicity**
no data available

**Skin corrosion/irritation**
no data available

**Serious eye damage/eye irritation**
no data available

**Respiratory or skin sensitization**
no data available

**Germ cell mutagenicity**
no data available

**Carcinogenicity**

**IARC:**
No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**ACGIH:**
No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

**NTP:**
No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**OSHA:**
No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity**
no data available

Teratogenicity
no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
Inhalation - May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard
no data available

Potential health effects

Inhalation Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Ingestion May be fatal if swallowed.

Skin May be harmful if absorbed through skin. Causes skin burns.

Eyes Causes eye burns. Causes severe eye burns.

Signs and Symptoms of Exposure
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Cough, Shortness of breath, Headache, Nausea

Synergistic effects
no data available

Additional Information
RTECS: TH3675000

12. ECOLOGICAL INFORMATION

Toxicity
no data available

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects
no data available

13. DISPOSAL CONSIDERATIONS

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1809  Class: 6.1 (8)  Packing group: I
Proper shipping name: Phosphorus trichloride
Reportable Quantity (RQ): 1000 lbs
Marine Pollutant: No
Poison Inhalation Hazard: Hazard zone B

IMDG
UN number: 1809  Class: 6.1 (8)  Packing group: I  EMS-No: F-A, S-B
Proper shipping name: PHOSPHORUS TRICHLORIDE
Marine Pollutant: No

IATA
UN number: 1809  Class: 6.1 (8)
Proper shipping name: Phosphorus trichloride
IATA Passenger: Not permitted for transport
IATA Cargo: Not permitted for transport

15. REGULATORY INFORMATION

OSHA Hazards
Toxic by inhalation., Highly toxic by ingestion, Corrosive

SARA 302 Components
The following components are subject to reporting levels established by SARA Title III, Section 302:

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SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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New Jersey Right To Know Components

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California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information
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