

## SAFETY DATA SHEET

Version 5.7  
Revision Date 05/27/2016  
Print Date 11/09/2018

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1. PRODUCT AND COMPANY IDENTIFICATION

## 1.1 Product identifiers

Product name : Di(1-adamantyl)chlorophosphine

Product Number : 737267

Brand : Aldrich

CAS-No. : 157282-19-4

## 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

## 1.3 Details of the supplier of the safety data sheet

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

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

## 1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

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2. HAZARDS IDENTIFICATION

## 2.1 Classification of the substance or mixture

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Substances and mixtures, which in contact with water, emit flammable gases (Category 3), H261

Skin corrosion (Category 1B), H314

Serious eye damage (Category 1), H318

Skin sensitisation (Category 1), H317

Carcinogenicity (Category 2), H351

Specific target organ toxicity - repeated exposure (Category 1), H372

For the full text of the H-Statements mentioned in this Section, see Section 16.

## 2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word : Danger

Hazard statement(s)

H261

In contact with water releases flammable gases.

H314

Causes severe skin burns and eye damage.

H317

May cause an allergic skin reaction.

H318

Causes serious eye damage.

H351

Suspected of causing cancer.

H372

Causes damage to organs through prolonged or repeated exposure.

Precautionary statement(s)

P201

Obtain special instructions before use.

|                           |   |
|---------------------------|---|
| P202                      | Do not handle until all safety precautions have been read and understood.   |
| P231 + P232               | Handle under inert gas. Protect from moisture.  |
| P260                      | Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.   |
| P264                      | Wash skin thoroughly after handling.  |
| P270                      | Do not eat, drink or smoke when using this product.   |
| P272                      | Contaminated work clothing should not be allowed out of the workplace.  |
| P280                      | Wear protective gloves/ protective clothing/ eye protection/ face protection.   |
| P301 + P330 + P331        | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  |
| P303 + P361 + P353        | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.   |
| P304 + P340 + P310        | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.   |
| P305 + P351 + P338 + P310 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. |
| P308 + P313               | IF exposed or concerned: Get medical advice/ attention.   |
| P333 + P313               | If skin irritation or rash occurs: Get medical advice/ attention.   |
| P363                      | Wash contaminated clothing before reuse.  |
| P370 + P378               | In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.  |
| P402 + P404               | Store in a dry place. Store in a closed container.  |
| P405                      | Store locked up.  |
| P501                      | Dispose of contents/ container to an approved waste disposal plant.   |

## 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Reacts violently with water.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

Synonyms : Bis(1-adamantyl)phosphinous chloride  
Diadamantylchlorophosphine  
Bis(tricyclo[3.3.1.1<sup>3,7</sup>]dec-1-yl)phosphinous chloride

Formula : C<sub>20</sub>H<sub>30</sub>ClP  
Molecular weight : 336.88 g/mol  
CAS-No. : 157282-19-4

#### Hazardous components

| Component                            | Classification   | Concentration |
|--------------------------------------|--|---------------|
| <b>Di-1-adamantylchlorophosphine</b> |  |               |
|                                      | Water-react. 3; Skin Corr. 1B; Eye Dam. 1; H261, H314  | <= 100 %      |
| <b>Tetrachloromethane</b>            |  |               |
|                                      | Acute Tox. 3; Skin Sens. 1B; Carc. 2; STOT RE 1; Aquatic Acute 3; Aquatic Chronic 3; Ozone 1; H301 + H311 + H331, H317, H351, H372, H412 | >= 1 - < 5 %  |

For the full text of the H-Statements mentioned in this Section, see Section 16.

## 4. FIRST AID MEASURES

### 4.1 Description of 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.

**4.2 Most important symptoms and effects, both acute and delayed**

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

**4.3 Indication of any immediate medical attention and special treatment needed**

No data available

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**5. FIREFIGHTING MEASURES****5.1 Extinguishing media****Suitable extinguishing media**

Dry powder

**5.2 Special hazards arising from the substance or mixture**

No data available

**5.3 Advice for firefighters**

Wear self-contained breathing apparatus for firefighting if necessary.

**5.4 Further information**

No data available

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**6. ACCIDENTAL RELEASE MEASURES****6.1 Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

**6.2 Environmental precautions**

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

**6.3 Methods and materials for containment and cleaning up**

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

**6.4 Reference to other sections**

For disposal see section 13.

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**7. HANDLING AND STORAGE****7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking. For precautions see section 2.2.

**7.2 Conditions for safe storage, including any incompatibilities**

Keep container tightly closed in a dry and well-ventilated place. Never allow product to get in contact with water during storage.

Air sensitive. Handle and store under inert gas.

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

#### Components with workplace control parameters

| Component          | CAS-No. | Value  | Control parameters              | Basis  |
|--------------------|---------|--|---------------------------------|--|
| Tetrachloromethane | 56-23-5 | TWA  | 5.000000 ppm                    | USA. ACGIH Threshold Limit Values (TLV)              |
|                    | Remarks | Liver damage<br>Suspected human carcinogen<br>Danger of cutaneous absorption |                                 |  |
|                    |         | STEL   | 10.000000 ppm                   | USA. ACGIH Threshold Limit Values (TLV)              |
|                    |         | Liver damage<br>Suspected human carcinogen<br>Danger of cutaneous absorption |                                 |  |
|                    |         | ST   | 2.000000 ppm<br>12.600000 mg/m3 | USA. NIOSH Recommended Exposure Limits               |
|                    |         | Potential Occupational Carcinogen<br>See Appendix A                          |                                 |  |
|                    |         | TWA  | 10.000000 ppm                   | USA. Occupational Exposure Limits (OSHA) - Table Z-2 |
|                    |         | Z37.17-1967  |                                 |  |
|                    |         | CEIL   | 25.000000 ppm                   | USA. Occupational Exposure Limits (OSHA) - Table Z-2 |
|                    |         | Z37.17-1967  |                                 |  |
|                    |         | Peak   | 200.000000 ppm                  | USA. Occupational Exposure Limits (OSHA) - Table Z-2 |
|                    |         | Z37.17-1967  |                                 |  |
|                    |         | See Table Z-2  |                                 |  |
|                    |         | TWA  | 5 ppm                           | USA. ACGIH Threshold Limit Values (TLV)              |
|                    |         | Liver damage<br>Suspected human carcinogen<br>Danger of cutaneous absorption |                                 |  |
|                    |         | STEL   | 10 ppm                          | USA. ACGIH Threshold Limit Values (TLV)              |
|                    |         | Liver damage<br>Suspected human carcinogen<br>Danger of cutaneous absorption |                                 |  |
|                    |         | ST   | 2 ppm<br>12.6 mg/m3             | USA. NIOSH Recommended Exposure Limits               |
|                    |         | Potential Occupational Carcinogen<br>See Appendix A                          |                                 |  |
|                    |         | See Table Z-2  |                                 |  |
|                    |         | TWA  | 10 ppm                          | USA. Occupational Exposure Limits (OSHA) - Table Z-2 |
|                    |         | Z37.17-1967  |                                 |  |
|                    |         | CEIL   | 25 ppm                          | USA. Occupational Exposure Limits (OSHA) - Table Z-2 |
|                    |         | Z37.17-1967  |                                 |  |
|                    |         | Peak   | 200 ppm                         | USA. Occupational Exposure Limits (OSHA) - Table Z-2 |
|                    |         | Z37.17-1967  |                                 |  |

|  |  |      |                                 |   |
|--|--|------|---------------------------------|---|
|  |  | TWA  | 2 ppm<br>12.6 mg/m <sup>3</sup> | USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000                           |
|  |  | PEL  | 2 ppm<br>12.6 mg/m <sup>3</sup> | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |
|  |  | Skin |                                 |   |
|  |  | C    | 200 ppm                         | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |
|  |  | Skin |                                 |   |
|  |  | STEL | 10 ppm<br>63 mg/m <sup>3</sup>  | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |
|  |  | Skin |                                 |   |

Hazardous components without workplace control parameters

## 8.2 Exposure controls

### Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

### Personal protective equipment

#### Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

#### Skin 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.

#### 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.

#### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) 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).

#### Control of environmental exposure

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

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

- |  |   |
|--|---|
| a) Appearance                              | Form: solid   |
| b) Odour                                   | No data available                                   |
| c) Odour Threshold                         | No data available                                   |
| d) pH                                      | No data available                                   |
| e) Melting point/freezing point            | Melting point/range: 168 - 173 °C (334 - 343 °F)    |
| f) Initial boiling point and boiling range | 235 - 240 °C (455 - 464 °F) at 1,013 hPa (760 mmHg) |
| g) Flash point                             | No data available                                   |
| h) Evaporation rate                        | No data available                                   |

|    |  |                   |
|----|--|-------------------|
| i) | Flammability (solid, gas)                    | No data available |
| j) | Upper/lower flammability or explosive limits | No data available |
| k) | Vapour pressure                              | No data available |
| l) | Vapour density                               | No data available |
| m) | Relative density                             | No data available |
| n) | Water solubility                             | No data available |
| o) | Partition coefficient: n-octanol/water       | No data available |
| p) | Auto-ignition temperature                    | No data available |
| q) | Decomposition temperature                    | No data available |
| r) | Viscosity                                    | No data available |
| s) | Explosive properties                         | No data available |
| t) | Oxidizing properties                         | No data available |

## 9.2 Other safety information

No data available

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## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

No data available

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

Reacts violently with water.

### 10.4 Conditions to avoid

Exposure to moisture

### 10.5 Incompatible materials

Strong oxidizing agents

### 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Oxides of phosphorus, Hydrogen chloride gas

Other decomposition products - No data available

In the event of fire: see section 5

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## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

No data available

#### Skin corrosion/irritation

No data available

#### Serious eye damage/eye irritation

No data available

**Respiratory or skin sensitisation**

No data available

**Germ cell mutagenicity**

No data available

**Carcinogenicity**

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Tetrachloromethane)

NTP: Reasonably anticipated to be a human carcinogen (Tetrachloromethane)

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

No data available

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**Additional Information**

RTECS: Not available

Cough, Shortness of breath, Headache, Nausea, Vomiting

Stomach - Irregularities - Based on Human Evidence  
(Tetrachloromethane)

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**12. ECOLOGICAL INFORMATION****12.1 Toxicity**

No data available

**12.2 Persistence and degradability**

No data available

**12.3 Bioaccumulative potential**

No data available

**12.4 Mobility in soil**

No data available

**12.5 Results of PBT and vPvB assessment**

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

**12.6 Other adverse effects**

No data available

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**13. DISPOSAL CONSIDERATIONS****13.1 Waste treatment methods****Product**

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. 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.

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## 14. TRANSPORT INFORMATION

### DOT (US)

UN number: 3096      Class: 8 (4.3)      Packing group: II  
Proper shipping name: Corrosive solids, water-reactive, n.o.s. (Di-1-adamantylchlorophosphine)  
Reportable Quantity (RQ): 286 lbs

Poison Inhalation Hazard: No

### IMDG

UN number: 3096      Class: 8 (4.3)      Packing group: II      EMS-No: F-G, S-L  
Proper shipping name: CORROSIVE SOLID, WATER-REACTIVE, N.O.S. (Di-1-adamantylchlorophosphine)

### IATA

UN number: 3096      Class: 8 (4.3)      Packing group: II  
Proper shipping name: Corrosive solid, water-reactive, n.o.s. (Di-1-adamantylchlorophosphine)

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## 15. REGULATORY INFORMATION

### SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

### SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

|                    | CAS-No. | Revision Date |
|--------------------|---------|---------------|
| Tetrachloromethane | 56-23-5 | 2007-07-01    |

### SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

### Massachusetts Right To Know Components

|                    | CAS-No. | Revision Date |
|--------------------|---------|---------------|
| Tetrachloromethane | 56-23-5 | 2007-07-01    |

### Pennsylvania Right To Know Components

|                               | CAS-No.     | Revision Date |
|-------------------------------|-------------|---------------|
| Di-1-adamantylchlorophosphine | 157282-19-4 |               |
| Tetrachloromethane            | 56-23-5     | 2007-07-01    |

### New Jersey Right To Know Components

|                               | CAS-No.     | Revision Date |
|-------------------------------|-------------|---------------|
| Di-1-adamantylchlorophosphine | 157282-19-4 |               |
| Tetrachloromethane            | 56-23-5     | 2007-07-01    |

### California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

Tetrachloromethane

| CAS-No. | Revision Date |
|---------|---------------|
| 56-23-5 | 2007-09-28    |

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## 16. OTHER INFORMATION

### Full text of H-Statements referred to under sections 2 and 3.

|                    |  |
|--------------------|--|
| Acute Tox.         | Acute toxicity   |
| Aquatic Acute      | Acute aquatic toxicity                                 |
| Aquatic Chronic    | Chronic aquatic toxicity                               |
| Carc.              | Carcinogenicity  |
| Eye Dam.           | Serious eye damage                                     |
| H261               | In contact with water releases flammable gases.        |
| H301 + H311 + H331 | Toxic if swallowed, in contact with skin or if inhaled |



|            |   |
|------------|---|
| H314       | Causes severe skin burns and eye damage.                        |
| H317       | May cause an allergic skin reaction.                            |
| H318       | Causes serious eye damage.                                      |
| H351       | Suspected of causing cancer.                                    |
| H372       | Causes damage to organs through prolonged or repeated exposure. |
| H412       | Harmful to aquatic life with long lasting effects.              |
| Ozone      | Hazardous to the ozone layer                                    |
| Skin Corr. | Skin corrosion  |
| Skin Sens. | Skin sensitisation  |

#### **HMIS Rating**

|                        |   |
|------------------------|---|
| Health hazard:         | 3 |
| Chronic Health Hazard: | * |
| Flammability:          | 3 |
| Physical Hazard        | 3 |

#### **NFPA Rating**

|                    |   |
|--------------------|---|
| Health hazard:     | 3 |
| Fire Hazard:       | 3 |
| Reactivity Hazard: | 1 |

#### **Further information**

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#### **Preparation Information**

Sigma-Aldrich Corporation  
Product Safety – Americas Region  
1-800-521-8956

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