

MATERIAL SAFETY DATA SHEET
Phosphorus Pentasulfide



Page 1 of 8
MSDS Ref No: 1314-80-3
Date Approved: 2/20/2007
Version: US/Canada
Revision No: 5

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Phosphorus Pentasulfide

SYNONYMS: Tetrphosphorus Decasulfide, Phosphorus Persulfide

GENERAL USE: Intermediate for lubricating oil additives or for pesticide manufacture. Also used as "sink float" agent for ore processing.

MANUFACTURER

Chemtrade Logistics INC.
440 North Ninth Street
Lawrence, KS 66044
General Information: 785-843-2290

Emergency Telephone Numbers:

CHEMTREC 1-800-424-9300
Emergency Phone 785-843-2290 ext 105
(Call Collect) Lawrence, KS

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt%
Phosphorus Pentasulfide	1314-80-3	

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW/IMMEDIATE CONCERNS:

Flammable solid and dangerous when wet. Reacts with water and/or water vapor (humid air) to produce flammable and toxic hydrogen sulfide gas and heat. Blanket spill or leaks with dry sand, clay or ground limestone. **DO NOT USE WATER.** In case of fire, use dry chemical, carbon dioxide, dry sand or class D fire Extinguishers. Wear full protective clothing and positive pressure self-contained breathing apparatus.

POTENTIAL HEALTH EFFECTS:

Airborne dust is irritating to eyes, nose, throat and skin. Reaction with moisture produces hydrogen sulfide gas that is irritating to lungs and eyes. Exposure to high concentrations (500-1000 ppm) of hydrogen sulfide gas causes unconsciousness and death from respiratory paralysis.

4. FIRST AID MEASURES

EYES:

Immediately flush with water for at least 15 minutes, lifting upper and lower eyelids intermittently. See a medical doctor immediately.

SKIN:

Remove contaminated clothing and thoroughly wash with soap and water. If irritation occurs and persists, contact a medical doctor.

MATERIAL SAFETY DATA SHEET

Phosphorus Pentasulfide



Page 2 of 8

MSDS Ref No: 1314-80-3

Date Approved: 3/10/1999

Version: US/Canada

Revision No: 4

INGESTION:

Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION:

Remove to fresh air. If breathing discomfort occurs and persists, see a medical doctor. If breathing has stopped, give artificial respirations and see a medical doctor immediately.

NOTES TO MEDICAL DOCTOR:

Hydrolyzes in the presence of moisture to hydrogen sulfide and phosphoric acid. Inhaled material is strongly irritating and may require administration of humidified oxygen and perhaps bronchodilators. Systemic effects of hydrogen sulfide may include alterations of consciousness, possible coma, respiratory arrest and anoxic terminal convulsions, thought to be due to inhibition of tissue (cytochrome) respiration. Supportive care should be instituted, particularly oxygen and/or artificial respiration (oxygen is useful here not only for hypoxia, but also to help oxidize sulfide to sulfate); there is no definitely proven antidote, although evidence is suggestive that intentional induction of methemoglobinemia - as for cyanide poisoning may be helpful. For this purpose, amyl nitrite may be given by inhalation until an intravenous preparation of sodium nitrite can be given slowly in an average starting dose of about 10cc of 3% solution for an adult. Careful attention to acid-base balance and its adjustment is also important.

5. FIRE FIGHTING MEASURES

FLAMMABLE LIMITS:

Not applicable

AUTOIGNITION TEMPERATURE:

Dust 260-290 degrees C

EXTINGUISHING MEDIA:

C02, dry chemical, sand and sodium chloride base D extinguishers - NFRS recommendation.

EXPLOSION HAZARDS:

Ignitable by spark or friction; dust presents explosion hazard; combustion yields toxic and corrosive phosphorus pentoxide and sulfur dioxide. Reacts with water to liberate toxic and flammable hydrogen sulfide gas and phosphoric acid.

FIRE FIGHTING PROCEDURES:

Do not use water. Entire bulk of material must be covered by extinguishing agent to prevent reignition. Goggles, protective clothing, and positive pressure self-contained breathing apparatus should be worn to protect against toxic gas and corrosive fumes.

FLASH POINT:

Not applicable

MATERIAL SAFETY DATA SHEET

Phosphorus Pentasulfide



Page 3 of 8

MSDS Ref No: 1314-80-3

Date Approved: 3/10/1999

Version: US/Canada

Revision No: 4

FIRE EXPLOSION:

Not known to be explosive.

SENSITIVITY TO STATIC DISCHARGE:

None

SENSITIVITY TO IMPACT:

None

HAZARDOUS DECOMPOSITION PRODUCTS:

Sulfur dioxide and phosphorus pentoxide from oxidation and hydrogen sulfide and phosphoric acid from reaction with water. Water, acids and oxidizing materials.

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES:

Wear full personal protective equipment as prescribed in Section 8. Keep spill covered to prevent exposure to moisture, using grounded tools, transfer into clean, dry containers. Avoid creating dust. Coat spill area with dry soda ash or sand. Carefully transfer into container. Finally flush residue in spill area with very large quantities of water.

7. HANDLING AND STORAGE

HANDLING:

Use in a totally enclosed process with a low moisture inert atmosphere. Maintain a low humidity atmosphere in the work areas where containers are opened and product is transferred to process. Avoid sliding or rough handling of containers. Dry powders can build static electricity when subjected to the friction of conveying, mixing or sliding. Adequate precautions, such as electrical grounding, bonding and inert atmospheres should be taken when P2S5 is either loaded or unloaded in order to prevent potential ignition. Grounding is not required during transportation.

STORAGE:

Store in cool, dry, well ventilated areas (mechanical exhaust ventilation system, if necessary) away from combustibles or open flames. Thoroughly ventilate vans or box cars to remove hydrogen sulfide gas. Grounding is not required during storage.

COMMENTS:

VENTILATION: Local exhaust ventilation must be provided for all potential sources of release of airborne product dust and toxic flammable hydrogen sulfide gas (lower explosive limit is 4.3%; upper explosive limit is 46.0%). The exhaust system should be designed with proper duct and capture velocities consistent with controlling release below established exposure limits. Use airline supplied respirator or self contained breathing apparatus if ventilation system is not adequate.

MATERIAL SAFETY DATA SHEET

Phosphorus Pentasulfide



Page 4 of 8

MSDS Ref No: 1314-80-3

Date Approved: 3/10/1999

Version: US/Canada

Revision No: 4

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	TWA (ACGIH)	STEL/Ceiling (ACGIH)	PEL (OSHA)	STEL/Ceiling (OSHA)
Phosphorus Pentasulfide	1 mg/m ³	3 mg/m ³	1 mg/m ³	3 mg/m ³

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE:

Safety glasses normally adequate; wear chemical safety goggles or face shield where appropriate.

RESPIRATORY:

In operations involving danger of contact with this product, use positive pressure self-contained breathing apparatus.

PROTECTIVE CLOTHING:

Leather gloves normally adequate; rubber, neoprene or vinyl also satisfactory. Flame resistant long sleeve shirt, trousers, cap or hard hat, closed shoes. Closed leather or rubber shoes. Contaminated clothing should be removed promptly and cleaned before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: Hydrogen sulfide (rotten eggs)

APPEARANCE: Yellow to yellow-green solid

pH: Not applicable

PERCENT VOLATILE: Not available

VAPOR PRESSURE: 1 mm Hg @ 300 degrees C

VAPOR DENSITY: (Air - 1): Approx. 9.5

BOILING POINT: 525 degrees C

MELTING POINT: 280 degrees C

SOLUBILITY IN WATER: (% by wt.) 25 degrees C (77.7 degrees F): Reacts with water to form hydrogen sulfide gas

EVAPORATION RATE: (Butyl Acetate - 1): Not available

DENSITY: 2

SPECIFIC GRAVITY: (H₂O=1): 2.03 @ 20degrees C

COEFF. OIL/WATER: Not applicable

ODOR THRESHOLD: Low - about 1 ppm

OXIDIZING PROPERTIES: Not applicable

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:

Sparks, heat or friction. Prevent exposure to moisture.

MATERIAL SAFETY DATA SHEET

Phosphorus Pentasulfide



Page 5 of 8

MSDS Ref No: 1314-80-3

Date Approved: 3/10/1999

Version: US/Canada

Revision No: 4

STABILITY:

Stable; highly reactive with other agents.

POLYMERIZATION:

Will not occur

HAZARDOUS DECOMPOSITION PRODUCTS:

Sulfur dioxide and phosphorus pentoxide from oxidation and hydrogen sulfide and phosphoric acid from reaction with water.

TLV Hazard Data - Hydrogen Sulfide

TWA (ACGIH/OSHA) - 10 ppm (14 mg/m³)

STEL (ACGIH/OSHA) - 15 ppm (21 mg/m³)

INCOMPATIBLE MATERIALS:

Water, acids, alcohols and oxidizing materials.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:

Moderate irritant (rabbit) (RTECS 1994)

SKIN EFFECTS:

Moderate irritant (rabbit) (RTECS 1994)

DERMAL LD 50:

No data available for the product.

ORAL LD 50:

389 mg/kg (rat) (RTECS 1994)

INHALATION LC 50:

No data available for the product.

TARGET ORGANS:

Eyes, skin, nose, throat, lungs.

ACUTE EFFECTS FROM OVEREXPOSURE:

This product is toxic by the oral and inhalation routes of exposure. It is moderately irritating to the eyes and skin. Inhalation of this product causes irritation of the respiratory tract, eyes, skin, nose, throat and mucous membranes. This product readily hydrolyzes to hydrogen sulfide and phosphoric acid in the presence of moisture. Both of these decomposition products are also severely irritating to eyes, skin and upper respiratory tract.

CHRONIC EFFECTS FROM OVEREXPOSURE:

No data available for the product.

MATERIAL SAFETY DATA SHEET

Phosphorus Pentasulfide



CHEMTRADE
LOGISTICS

Page 6 of 8

MSDS Ref No: 1314-80-3

Date Approved: 3/10/1999

Version: US/Canada

Revision No: 4

CARCINOGENICITY:

IARC:

Not listed

NTP:

Not listed

OSHA:

Not listed

OTHER:

ACGIH: Not Listed

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:

No data available for the product.

CHEMICAL FATE INFORMATION:

Reacts with water to form poisonous flammable (explosive) hydrogen sulfide and phosphoric acid.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:

Due to the sulfide - bearing nature of this chemical, waste from this product is considered a hazardous waste and should be disposed of properly, while complying with all federal, state and local regulations.

14. TRANSPORT INFORMATION

U.S. DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Phosphorus Pentasulfide

PRIMARY HAZARD CLASS/DIVISION: 4.3

UN/NA NUMBER: UN 1340

PACKING GROUP: II

PLACARDS: Dangerous when wet

LABEL: Dangerous when wet, flammable solid (for non-bulk packages).

OTHER SHIPPING INFORMATION:

DOT Marking: Phosphorus Pentasulfide UN 1340

Hazardous Substance/RQ = 100 lbs. (45.4 kg)

49 STCC Number: 4916320

MATERIAL SAFETY DATA SHEET

Phosphorus Pentasulfide



CHEMTRADE
LOGISTICS

Page 7 of 8

MSDS Ref No: 1314-80-3

Date Approved: 3/10/1999

Version: US/Canada

Revision No: 4

SPECIAL SHIPPING NOTES:

IMDG: Phosphorus Pentasulphide

IATA: Phosphorus Pentasulphide

Usually shipped in aluminum tote bins or nitrogen purged bulk rail cars.

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 311 HAZARD CATEGORY (40 CFR 370): Fire Hazard, Immediate (Acute) Health Hazard, Reactive

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370): (Phosphorus Pentasulfide);
500 lbs. (Hydrogen Sulfide)

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372): Not listed

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):

Listed (Hydrogen Sulfide)

RQ: 100 lbs.

THRESHOLD QUANTITY: 500 lbs.

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA REGULATORY (40 CFR 302.4): Listed

CERCLA RQ: Hydrogen Sulfide, 100 lbs., Category B
Phosphorus Pentasulfide, Category B

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT):

Listed

Chemical Name

Phosphorus Pentasulfide

Wt.%

RQ

100 lbs.

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS (40 CFR 710): Listed

RCRA STATUS:

Waste No. U189 (Phosphorus Pentasulfide); U135 (Hydrogen Sulfide)

MATERIAL SAFETY DATA SHEET

Phosphorus Pentasulfide



Page 8 of 8
MSDS Ref No: 1314-80-3
Date Approved: 3/10/1999
Version: US/Canada
Revision No: 4

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):

Product Identification No: 1340

Hazard Classification: Class B, Division A (Flammable and Combustible Material): Class D, Div 1, Subdiv. B

Ingredient Disclosure List: Listed

16. OTHER INFORMATION

REVISION SUMMARY

Revision #: 4

This MSDS replaces the December 22, 1998 MSDS. Any changes in information are as follows:

In Section 7

Handling (text) Storage (text)

HMIS RATING

HEALTH:	2
FLAMMABILITY:	1
REACTIVITY:	2
PROTECTION:	K

NFPA RATING

HEALTH:	2
FLAMMABILITY:	1
REACTIVITY:	2
SPECIAL:	WR

Key

4 = Severe

3 = Serious

2 - Moderate

1 = Slight

0 = Minimal

HMIS RATING NOTES:

Protection = K (Airborne hood or mask, gloves, full protective suite, boots)

The contents and format of this MSDS are in accordance with OSHA Hazard Communication Standard and Canada's Workplace Hazardous Information System (WHMIS).

National Fire Protection Association (NFPA)

SPECIAL = WR (Water Reactive)

Hazardous Materials Identification System (HMIS)