

PHOSPHORUS PENTASULFIDE

PPP

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Phosphoric sulfide Phosphorus persulfide Thiophosphoric anhydride	Solid-flakes or powder Yellow to green Odorless or rotten egg odor	Sinks and reacts with water. Poisonous gas is produced.
<p>Keep people away. Avoid contact with solid and dust. Wear goggles and self-contained breathing apparatus. Shut off ignition sources and call fire department. Evacuate area in case of large discharge. Stay upwind. Notify local health and pollution control agencies. Protect water intakes.</p>		
Fire	<p>FLAMMABLE. MAY BE IGNITED BY SPARK, FRICTION, OR STATIC DISCHARGE. Containers may explode in fire. POISONOUS. IRRITATING GASES ARE PRODUCED IN FIRE. Wear goggles and self-contained breathing apparatus. DO NOT USE WATER. Extinguish with carbon dioxide or sand.</p>	
Exposure	<p>CALL FOR MEDICAL AID. DUST Irritating to eyes, nose and throat. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>SOLID Irritating to skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.</p>	
Water Pollution	<p>HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.</p>	

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse dissolved material
Stop discharge
Chemical and Physical Treatment:
Neutralize
Do not add water to undissolved material

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: P₂S₅-P₂S₁₀
2.3 IMO/UN Designation: 4.1/1340
2.4 DOT ID No.: 1340
2.5 CAS Registry No.: 1314-80-3
2.6 NAERG Guide No.: 139
2.7 Standard Industrial Trade Classification: 52242

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Chemical safety goggles; plastic face shield; self-contained or air-line respirator.
- 3.2 **Symptoms Following Exposure:** Hydrogen sulfide gas formed by reaction with moisture can cause death by respiratory failure. The gas also irritates eyes and respiratory system. The solid irritates skin and eyes; the symptoms may be delayed several hours.
- 3.3 **Treatment of Exposure:** INHALATION: remove victim from contaminated area; if breathing has stopped, begin artificial respiration. INGESTION: induce vomiting; call physician. SKIN: remove contaminated clothing and wash areas with large amounts of water. EYES: flush with large amounts of water.
- 3.4 TLV-TWA: 1 mg/m³
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: 3 mg/m³
3.7 Toxicity by Ingestion: Currently not available
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Hydrogen sulfide gas, formed by reaction with moisture, causes severe irritation of eyes and throat and can cause eye and lung injury. It cannot be tolerated even at low concentrations.
- 3.11 **Liquid or Solid Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
- 3.12 **Odor Threshold:** 0.0047 ppm (hydrogen sulfide). High (lethal) concentrations can paralyze the sense of smell.
- 3.13 IDLH Value: 250 mg/m³
3.14 OSHA PEL-TWA: 1 mg/m³
3.15 OSHA PEL-STEL: Not listed.
3.16 OSHA PEL-Ceiling: Not listed.
3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

- 4.1 **Flash Point:** Flammable solid
4.2 **Flammable Limits in Air:** Not pertinent
4.3 **Fire Extinguishing Agents:** Sand and carbon dioxide
4.4 **Fire Extinguishing Agents Not to Be Used:** Water
4.5 **Special Hazards of Combustion Products:** Products of combustion include sulfur dioxide and phosphorus pentoxide, which are irritating, toxic and corrosive.
4.6 **Behavior in Fire:** Not pertinent
4.7 **Auto Ignition Temperature:** 288°F.
4.8 **Electrical Hazards:** Not pertinent
4.9 **Burning Rate:** Not pertinent
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** 107.1 (calc.)
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** 18.0 (calc.)
4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** N₂ diluent: 9.3%; CO₂ diluent: 12.0%

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Reacts with liquid water or atmospheric moisture to liberate toxic hydrogen sulfide gas.
5.2 **Reactivity with Common Materials:** No reaction
5.3 **Stability During Transport:** Can be ignited by friction.
5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
5.5 **Polymerization:** Not pertinent
5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:** Currently not available
6.2 **Waterfowl Toxicity:** Currently not available
6.3 **Biological Oxygen Demand (BOD):** Currently not available
6.4 **Food Chain Concentration Potential:** None
6.5 **GESAMP Hazard Profile:** Not listed

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** "Regular" (low reactivity), "reactive" (high reactivity), distilled, undistilled; all 99+%
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** No requirement
7.4 **Venting:** Sealed containers must be stored in a well-ventilated area
7.5 **IMO Pollution Category:** Currently not available
7.6 **Ship Type:** Currently not available
7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Dangerous When Wet
8.2 **49 CFR Class:** 4.3
8.3 **49 CFR Package Group:** II
8.4 **Marine Pollutant:** No
8.5 **NFPA Hazard Classification:**
- | Category | Classification |
|---------------------------|----------------|
| Health Hazard (Blue)..... | 2 |
| Flammability (Red)..... | 1 |
| Instability (Yellow)..... | 2 |
| Special (White)..... | W |
- 8.6 **EPA Reportable Quantity:** 100 pounds
8.7 **EPA Pollution Category:** B
8.8 **RCRA Waste Number:** U189
8.9 **EPA FWPCA List:** Yes

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Solid
9.2 **Molecular Weight:** 222.27
9.3 **Boiling Point at 1 atm:** 957°F = 514EKC = 787°K
9.4 **Freezing Point:** 527°F = 275°C = 548°K
9.5 **Critical Temperature:** Not pertinent
9.6 **Critical Pressure:** Not pertinent
9.7 **Specific Gravity:** 2.03 at 20°C (solid)
9.8 **Liquid Surface Tension:** Not pertinent
9.9 **Liquid Water Interfacial Tension:** Not pertinent
9.10 **Vapor (Gas) Specific Gravity:** Not pertinent
9.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
9.12 **Latent Heat of Vaporization:** 184 Btu/lb = 102 cal/g = 4.27 X 10⁵ J/kg
9.13 **Heat of Combustion:** -10,890 Btu/lb = -6,050 cal/g = -253.3 X 10⁵ J/kg
9.14 **Heat of Decomposition:** Not pertinent
9.15 **Heat of Solution:** (est.) -20 Btu/lb = -12 cal/g = -0.5 X 10⁵ J/kg
9.16 **Heat of Polymerization:** Not pertinent
9.17 **Heat of Fusion:** Currently not available
9.18 **Limiting Value:** Currently not available
9.19 **Reid Vapor Pressure:** Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
	N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	R E A C T S		N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T