

# TRIS(AZIRIDINYL)PHOSPHINE OXIDE

TPO

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b>		Solid	White
APO Tris(1-Aziridinyl) phosphine oxide Phosphoric acid triethylenimine Triethylenephosphoramidate		Mixes with water.	
<p style="color: red;">Keep people away. Avoid contact with solid and dust. Notify local health and pollution control agencies. Protect water intakes.</p>			
<b>Fire</b>	Not flammable. POISONOUS GASES MAY BE PRODUCED WHEN HEATED.		
<b>Exposure</b>	Call for medical aid.  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.		
<b>Water Pollution</b>	Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.		

### 1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse  
Stop discharge

### 2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: Not listed.
- 2.2 Formula: (CH<sub>2</sub>CH<sub>2</sub>N)<sub>3</sub>PO or C<sub>6</sub>H<sub>12</sub>N<sub>3</sub>PO
- 2.3 IMO/UN Designation: Not listed
- 2.4 DOT ID No.: 2501
- 2.5 CAS Registry No.: 545-55-1
- 2.6 NAERG Guide No.: 152
- 2.7 Standard Industrial Trade Classification: 51479

### 3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Protective clothing and gloves to prevent contact with skin; goggles.
- 3.2 **Symptoms Following Exposure:** Inhalation (unlikely unless a heavy mist is formed) causes symptoms similar to those observed after ingestion. Contact with liquid or powder causes irritation of eyes and (on prolonged contact) irritation and burns of skin. Burns are slow to develop and slow to heal. May sensitize on repeated contact. Ingestion causes depression, anorexia, and diarrhea, appearing 2-3 days before death, followed by terminal dyspnea, incoordination, epistaxis, salivation, prostration and cyanosis.
- 3.3 **Treatment of Exposure:** INHALATION: remove victim to fresh air. EYES: flush with water at once for at least 15 min.; get medical attention. SKIN: flush with water at once, followed by vinegar and dilute hydrogen peroxide. INGESTION: only symptomatic and supportive measures are available.
- 3.4 TLV-TWA: Not listed.
- 3.5 TLV-STEL: Not listed.
- 3.6 TLV-Ceiling: Not listed.
- 3.7 **Toxicity by Ingestion:** Grade 4; oral rat LD<sub>50</sub> = 37 mg/kg
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** None observed
- 3.10 **Vapor (Gas) Irritant Characteristics:** Currently not available
- 3.11 **Liquid or Solid Characteristics:** Currently not available
- 3.12 **Odor Threshold:** Currently not available
- 3.13 **IDLH Value:** Not listed.
- 3.14 **OSHA PEL-TWA:** Not listed.
- 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:**  
Not flammable
- 4.2 **Flammable Limits in Air:** Not flammable
- 4.3 **Fire Extinguishing Agents:** Not pertinent
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Not pertinent
- 4.5 **Special Hazards of Combustion Products:** Phosphoric acid mist may form in fire. Toxic oxides of nitrogen may form.
- 4.6 **Behavior in Fire:** Currently not available
- 4.7 **Auto Ignition Temperature:** Not pertinent
- 4.8 **Electrical Hazards:** Currently not available
- 4.9 **Burning Rate:** Not pertinent
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** Not pertinent.
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** Not pertinent.
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

### 5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** No reaction, unless in presence of acids or strong caustics
- 5.2 **Reactivity with Common Materials:** Slow decomposition, not considered hazardous
- 5.3 **Stability During Transport:** Stable if cool
- 5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
- 5.5 **Polymerization:** Violent polymerization occurs at about 255°F. Acid fumes also cause polymerization at ordinary temperatures.
- 5.6 **Inhibitor of Polymerization:** None used

### 6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**  
Currently not available
- 6.2 **Waterfowl Toxicity:** 8.5-13 mg/kg LD<sub>50</sub>
- 6.3 **Biological Oxygen Demand (BOD):**  
Currently not available
- 6.4 **Food Chain Concentration Potential:**  
None
- 6.5 **GESAMP Hazard Profile:**  
Bioaccumulation: 0  
Damage to living resources: -  
Human Oral hazard: 3  
Human Contact hazard: II  
Reduction of amenities: XX

### 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 85% solution in acetone-methylene chloride
- 7.2 **Storage Temperature:** Below 100°F
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Open
- 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:** Poison
- 8.2 **49 CFR Class:** 6.1
- 8.3 **49 CFR Package Group:** II
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:** Not listed
- 8.6 **EPA Reportable Quantity:** Not listed.
- 8.7 **EPA Pollution Category:** Not listed.
- 8.8 **RCRA Waste Number:** Not listed
- 8.9 **EPA FWPCA List:** Not listed

### 9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Solid
- 9.2 **Molecular Weight:** 173.16
- 9.3 **Boiling Point at 1 atm:** Not pertinent (decomposes)
- 9.4 **Freezing Point:** 106°F = 41°C = 314°K
- 9.5 **Critical Temperature:** Not pertinent
- 9.6 **Critical Pressure:** Not pertinent
- 9.7 **Specific Gravity:** (est.) >1 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:** Not pertinent
- 9.13 **Heat of Combustion:** Not pertinent
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** Not pertinent
- 9.16 **Heat of Polymerization:** Currently not available
- 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
	V E R Y  S O L U B L E		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