



Red Phosphorus

Material Safety Data Sheet

Section 1: Chemical Product and Company Identification

Product Name: Red Phosphorus
CAS Number: 7723-14-0
Synonym: N/A
Chemical Name: Red Phosphorus
Chemical Formula: P

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS Number:	% by Weight
Red Phosphorus	7723-14-0	100

Toxicological Data on Ingredients: Red Phosphorus LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:

Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Severe over-exposure can result in death.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, liver. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 260°C (500°F)

Flammable Limits: Not Available

Products of Combustion: Not Available

Fire Hazards in Presence of Various Substances:

Flammable in presence of open flames and sparks, of heat, of oxidizing materials. Non-flammable in presence of shocks

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions:

Flammable solid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, auto ignition or explosion.

Special Remarks on Fire Hazards:

COMBUSTIBLE SOLID. Under fire situations, the more hazardous white phosphorus may be formed. When heated to decomposition it emits irritating fumes. May ignite with friction or contact with oxidizers. Combustion by-products include oxides of phosphorus, phosphine, phosphoric acid if water is present. Catches fire when heated in air to about 260 C and burns with formation of the pentoxide. Burns with a pale green light when heated in an atmosphere of chlorine. Phosphorus boiled with alkaline hydroxides yields mixed phosphines which may ignite spontaneously in air Red phosphorus and boron triiodide or lead dioxide, or zirconium or sodium peroxide react with incandescence. Phosphorus ignites the vapour of nitric acid and burns with an intense white light.

Special Remarks on Explosion Hazards:

Explosions may result on contact or friction. Finely divided phosphorus with bromates, chlorates, and iodates of barium, calcium, magnesium, potassium, sodium, or zinc will explode with heat, percussion, or sometimes light friction. Dangerous explosion hazard by chemical reaction with Antimony pentafluoride, Barium bromate, Beryllium, Calcium bromate, Magnesium bromate, Potassium bromate, Sodium bromate, Zinc bromate, Bromine, Bromine trifluoride, BrN₃, Cesium, CsHC₂, Cs₃N, Chlorite, (Cl₂ + heptane), ClO, Chlorine trifluoride, Chlorate, CrO₃, Cr(OCl)₂, copper, NCl, Iodine monobromide, Iodine monochloride, Iodine pentafluoride, Iron, Lanthanum, Li₂C₂, Li₆CS, magnesium perchlorate, manganese, Neodymium, nickel, nitrates (silver nitrate), NBr, Nitrogen dioxide, Nitrogen bromide, Nitrogen chloride, NOF, FNO₂, oxygen, performic acid, Platinum, K₃N, K₂O₂, RbHC₂, Se₂Cl₂, SeOF₂, SeF₄, Na₂C₂, Na₂O₂, Thorium, peroxyformic acid, halogen azides, hexalithium disilicide, vanadium oxytrichloride, sodium peroxide

Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:

Flammable solid. Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapour drift. Use water spray to reduce vapours. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, alkalis.

Storage:

Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles. Lab coat. Vapour respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapour respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 0.02 (ppm) from ACGIH (TLV) [United States] TWA: 0.1 (mg/m³) from OSHA (PEL) [United States] TWA: 0.1 (mg/m³) from NIOSH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Powdered solid.)

Odour: Garlic-like; Acrid

Taste: Not Available

Molecular Weight: 30.974 g/mole

Colour: Red (Dark)

pH (1% soln/water): Not Available

Boiling Point: Not Available

Melting Point: Sublimation temperature: 416°C (780.8°F)

Critical Temperature: 720.85°C (1329.5°F)

Specific Gravity: 2.36 (Water = 1)

Vapour Pressure: Not Available

Volatility: Not available.

Odour Threshold: Not Available

Water/Oil Dist. Coeff.: Not Available

Ionicity (in Water): Not available.

Dispersion Properties: Not Available

Solubility: Very slightly soluble in cold water. Insoluble in hot water, diethyl ether. Insoluble in ammonia, carbon disulphide. Soluble in absolute alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatible materials, dust generation

Incompatibility with various substances: Reactive with oxidizing agents, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Reacts with halogens, halides, selenium oxychloride, iodine, oxygen, chlorine, sulphur, oxidizing materials (i.e. potassium permanganate, potassium chlorate, peroxides, etc.); finely divided phosphorus with bromates, chlorates, and iodates of barium, calcium, magnesium, potassium, sodium, or zinc. Reacts with strong alkali to form highly toxic phosphine gas. Phosphorus reacts vigorously below 250 deg C with any of the following materials: cesium, lithium, potassium, rubidium, sodium, sulphur.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry:

Inhalation. Ingestion.

Toxicity to Animals:

Not Available

Chronic Effects on Humans:

Causes damage to the following organs: kidneys, liver

Other Toxic Effects on Humans:

Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:

Lowest Published Lethal Dose: LDL [Man] - route: unreported; Dose: 4412 ug/kg

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes skin irritation. Eyes: Causes eye irritation. Inhalation: Causes respiratory tract irritation. Ingestion: Red Phosphorus is non-volatile, insoluble, and unabsorbable and is considered nontoxic when ingested. However, it may contain traces of toxic yellow phosphorus (up to .6%) and large ingestions may result in adverse systemic effects (central nervous system effects, cardiovascular system effects, and hypoglycemia). May cause irritation of the digestive tract, with vomiting, diarrhoea, stomach pains. May cause kidney and liver damage. In general, depending on the intensity and duration of exposure, the effects may vary from mild irritation to severe

Section 12: Ecological Information

Ecotoxicity: Not Available

Toxicity of the Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation:

Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 4.1: Flammable solid.

Identification: Phosphorous, amorphous UNNA: 1338 PG: III

Special Provisions for Transport: Not available

Section 15: Other Regulatory Information

Federal and State Regulations:

Connecticut hazardous material survey.: Phosphorus, red Illinois toxic substances disclosure to employee act: Phosphorus, red Illinois chemical safety act: Phosphorus, red New York release reporting list: Phosphorus, red Rhode Island RTK hazardous substances: Phosphorus, red Pennsylvania RTK: Phosphorus, red Minnesota: Phosphorus, red Massachusetts RTK: Phosphorus, red Massachusetts spill list: Phosphorus, red New Jersey: Phosphorus, red New Jersey spill list: Phosphorus, red Louisiana RTK reporting list: Phosphorus, red Louisiana spill reporting: Phosphorus, red California Directors List of Hazardous Substances: Phosphorus, red TSCA 8(b) inventory: Phosphorus, red TSCA 8(d) H and S data reporting: Phosphorus, red: effective 4/12/93; sunset: 6/30/98 SARA 302/304/311/312 extremely hazardous substances: Phosphorus, red CERCLA: Hazardous substances.: Phosphorus, red: 1 lbs. (0.4536 kg)

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS B-4: Flammable solid. CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):

R11- Highly flammable. R16- Explosive when mixed with oxidizing substances. S7- Keep container tightly closed. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36- Wear suitable protective clothing. HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 2

Reactivity: 0

Personal Protection: E

National Fire Protection

Association (U.S.A.):

Health: 1

Flammability: 1

Reactivity: 1

Specific

hazard:

Specific

Protective

Equipment:

Gloves. Lab coat. Vapour respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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