

Phosphoric Acid

Date of Preparation: September 2003

Revision: 2

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Phosphoric acid

Chemical Formula: H₃PO₄

Other Designations: Phosphoric Acid 20:1, Phosphoric Acid 80%, Phosphoric Acid 86%, Hydrogen phosphate, *O*-Phosphoric Acid; Ortho-Phosphoramidate; Orthophosphoric acid; Phosphoric acid (aqueous); white phosphoric acid

General Use: Inorganic phosphates, pickling metals, electropolishing, coatings for metals, chelating agent, and in superphosphates.

Manufacturer: Kanto Corporation, 13424 N. Woodrush Way, Portland, OR 97203

Non-Emergency Contact: Customer Service, Phone (503) 283-0405, FAX (503) 240-0409

For All Transportation Emergencies Call CHEMTREC at 1-800-424-9300

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	% by wt.
Phosphoric Acid	7664-38-2	7-86
De-Ionized Water	7732-18-5	Balance

Occupational Exposure Limits

Ingredient	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH
	TWA	STEL	TWA	STEL	TWA	STEL	IDLH
Phosphoric Acid	1 mg/m ³	3 mg/m ³	1 mg/m ³	3 mg/m ³	1 mg/m ³	3 mg/m ³	1000 ppm

Section 3 - Hazards Identification

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Corrosive! Symptoms of exposure may not be immediate! Destructive to soft tissues including eyes, skin, and respiratory tract. Odorless, clear, syrupy liquid. Strong acid that can generate significant heat on neutralization or diluting with water. Do not mix with solutions containing bleach or ammonia.

HMIS

H 3

F 0

R 0

PPE †

†Sec. 8

Potential Health Effects

Primary Entry Routes: Inhalation, eye and skin contact

Target Organs: Eyes, skin, respiratory system, bladder, and kidneys.

Acute Effects

Inhalation: Mists and vapors are extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes and skin. Inhalation may result in severe swelling and fluid accumulation in the larynx and bronchi, chemical pneumonitis and pulmonary edema. Symptoms include cyanosis, burning sensation, irritation of the nose, throat, and lungs, coughing, wheezing, laryngitis, shortness of breath, hypotension, headache, nausea, and vomiting.

Eye: Contact with mist or liquid may cause irritation and severe eye burns leading to permanent damage.

Skin: Painful severe skin burns and ulcerations.

Ingestion: Nausea, vomiting, abdominal pain, bloody diarrhea and vomit, acidosis, shock, and irritation or burns of the mouth, mucous membranes, esophagus, and stomach.

Carcinogenicity: Not listed

Medical Conditions Aggravated by Long-Term Exposure: Upper respiratory, chronic pulmonary, and skin conditions.

Chronic Effects: Long-term exposure may cause upper respiratory disease, dermatitis of the skin, and eye conjunctivitis.

Section 4 - First Aid Measures

Eye Contact: Gently lift eyelids and flush immediately and continuously with copious amounts of water for at least 15 minutes. Do not allow the victim to rub or keep eyes tightly shut. Consult an ophthalmologist immediately.

Skin Contact: Rinse with flooding amounts of water, while removing contaminated clothing, for at least 15 minutes. Wash with soap and water. Seek medical attention immediately. Wash clothing before reuse.

Ingestion: If the victim is conscious, give large amounts of water. Seek medical attention immediately. Never give anything by mouth to an unconscious or convulsing person.

Inhalation: Remove exposed person to an uncontaminated atmosphere and support breathing. If not breathing, give artificial respiration. Seek medical attention immediately.

After first aid, seek immediate in-plant, paramedic, or community medical support.

Section 5 - Fire-Fighting Measures

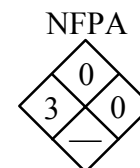
Flash Point: N/A

Auto ignition Temperature: N/A

LEL: N/A

UEL: None reported

Flammability Classification: Noncombustible liquid



Extinguishing Media: Carbon dioxide, dry chemical powder, water fog or appropriate foam; alcohol-resistant foam may also be used.

Unusual Fire or Explosion Hazards: Decomposes when heated, as well as upon contact with most metals, to release explosive hydrogen gas. Can form a detonable mixture with nitromethane. May ignite combustibles. Containers may explode when heated.

Hazardous Combustion Products: Combustion products include irritating, corrosive and toxic phosphorous oxides, pyrophosphoric acid, and phosphine.

Fire-Fighting Instructions: Use water spray to keep fire-exposed containers cool. Phosphoric acid sinks in and will mix with water, evolving heat. Do not release runoff from fire control methods to sewers or waterways, as it may be corrosive and toxic. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tanks, because vessel may rupture. Stay away from ends of tanks.

Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full-face piece operated in pressure-demand or positive-pressure mode. Prevent contact with skin and eyes. Wear chemical protective clothing that is specifically recommended by the manufacturer.

Section 6 - Accidental Release Measures

Small Spills: Cover with dry lime or soda ash, dry earth, sand or other non-combustible material and carefully scoop up material and place in a closed container. Do not get water inside containers. Ventilate area and wash spill site after material pickup is complete. Spilled material can also be covered with sodium carbonate or mixture of soda ash and slaked lime while adding water to form a slurry. Spill may then be discharged along with a large quantity of water into a containment basin.

Large Spills: Wear a self-contained breathing apparatus, rubber boots, heavy rubber gloves, and rubberized suit. Dike far ahead of liquid spill for later disposal. Isolate spill or leak area immediately for at least 80 to 160 feet in all directions. Eliminate all ignition sources, evacuate area, and stay upwind. Keep out of low areas and depressions. Ventilate enclosed areas. Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing. Stop leak if it can be done without undue risk. Do not release into sewers or waterways.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Use in a well ventilated area; consider using in a chemical fume hood. Avoid inhalation and prolonged or repeated exposure. Do not get in eyes, on skin, or on clothing. Do not use soft iron or alloy equipment. Do not allow water to enter the container. Empty container may contain hazardous product residue and vapors. Follow all label warnings even after the container is empty.

Storage Requirements: Keep tightly closed in a warm (20:1 - 40°F+; 80-86% - warm), well-ventilated location with other corrosives. Store away from incompatible substances.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.

Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance and Odor: Clear, colorless, odorless, liquid at 50% and 75%, syrupy at 85%

Vapor Pressure: 5.65 mm Hg at 20 °C

Vapor Density (Air=1): ~3.4

Formula Weight: 98.0

Specific Gravity (H₂O=1, at 4 °C): >1

Water Solubility: Miscible

Boiling Point: 275 °F (135 °C) for 75-85%

Freezing Point: concentration dependent

Viscosity: 12 centistokes at 25 °C

Refractive Index: 1.43

pH (0.1N solution): 1.5

Section 10 - Stability and Reactivity

Stability: Phosphoric acid is stable at room temperature in closed containers under normal storage and handling conditions.

Polymerization: Hazardous polymerization can occur with epoxides, azo compounds and compounds which can be polymerized.

Chemical Incompatibilities: Reacts with alkalis to form phosphate salts. Is corrosive to metals and alloys especially in granular or powdered form when hot. Liberates flammable hydrogen gas when exposed to chlorides and stainless steel. Reacts violently with sodium tetrahydroborate. Causes reactions with nitromethane, sodium tetrahydroborate, aldehydes, amines, amides, alcohols, glycols, azo-compounds, carbamates, esters, phenols, cresols, ketones, organophosphates, epoxides, explosives, combustible materials, unsaturated halides, organic peroxides, halogenated organics, nickel carbonate. May form flammable or toxic fumes with sulfides, mercaptans, cyanides, and aldehydes. Do not mix with solutions containing bleach or ammonia.

Conditions to Avoid: Avoid ignition sources, water in containers, excess heat, and incompatible materials.

Hazardous Decomposition Products: Thermal oxidative decomposition of phosphoric acid may produce pyrophosphoric acid, phosphorus oxides and phosphine, and hydrogen gas.

Section 11- Toxicological Information*

Acute Effects

Rabbit, eye, standard Draize test: 119 mg - Severe

Rabbit, skin, standard Draize test: 595 mg 24 hr - Severe

Rabbit, skin, LD₅₀: 2740 mg/kg

Rat, inhalation, LC₅₀: >850 mg/m³/1 hr

Rat, oral, LD₅₀: 1530 mg/kg

Human, unreported route, TD_{L0}: 220 mg/kg

Chronic Effects: Long-term exposure may cause upper respiratory disease, dermatitis of the skin, and eye conjunctivitis.

Carcinogenicity: None listed

Mutagenicity: None listed

Teratogenicity: None listed

* See NIOSH, *RTECS (TB6300000)*, for additional toxicity data.

Section 12 - Ecological Information

Ecotoxicity: Mosquito fish, TLm 138 mg/L/24 to 96 hr in turbid water at 72-75 °F. Lethal to fully developed fish in most natural waters at pH 5.

Environmental Fate: It is dangerous to aquatic life in high concentrations by lowering the pH level. Phosphates are found in natural waters and can persist indefinitely.

Soil Absorption/Mobility: When spilled onto soil, phosphoric acid will infiltrate downward. Increasing sodium concentration makes the weakly adsorbed phosphorus unstable. Phosphoric acid will dissolve some of the soil material, in particular carbonate-based materials, and will be neutralized to some degree. Upon reaching groundwater, the acid will continue to move in the direction of groundwater flow forming a contaminated plume.

Section 13 - Disposal Considerations

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Neutralize to a pH of 5-9 before releasing to a waste water treatment facility.

Disposal Regulatory Requirements: Follow applicable Federal, state, and local regulations.

Section 14 - Transport Information**DOT Transportation Data (49 CFR 172.101):****Shipping Name:** Phosphoric acid, liquid**Hazard Class:** 8**ID No.:** UN1805**Packing Group:** III**Label:** 8**Special Provisions (172.102):**

A7, IB3, IP3, N34, T4, TP1

Packaging Authorizations**Exceptions:** 173.154**Non-bulk Packaging:** 173.203**Bulk Packaging:** 173.241**Quantity Limitations****Passenger, Aircraft, or Railcar:** 5L**Cargo Aircraft Only:** 60L**Vessel Stowage Requirements****Vessel Stowage:** A**Emergency Response Guidebook #** 154**Section 15 - Regulatory Information****EPA Regulations:**

RCRA Hazardous Waste Number: (40 CFR 261.33) D002

RCRA Hazardous Waste Classification (40 CFR 261.22): Characteristic of Corrosivity

CERCLA Hazardous Substance (40 CFR 302.4) listed specific per RCRA, Sec. 3001; CWA, Sec. 311 (b)(4); CWA, Sec. 307(a), CAA, Sec. 112

CERCLA Reportable Quantity (RQ), 1000 lb (2270 kg) as 100% Phosphoric Acid

SARA Toxic Chemical (40 CFR 372.65): Not listed

SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not listed

TSCA: Listed

OSHA Regulations:

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): Listed

Section 16 - Other Information**Revision Notes:** Revisions to Sections 3, 9, 11, and 14.

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