CALEDON LABORATORY CHEMICALS

MATERIAL SAFETY DATA SHEET

PHOSPHORIC ACID

PRODUCT IDENTIFICATION

Chemical Name and Synonyms:
Phosphoric acid; Orthophosphoric acid
Chemical Family:
Inorganic acid/mineral acid
Chemical Formula:
H_3PO_4
Product Use:
Laboratory chemical
Manufacturer's Name and Address:
Caledon Laboratories Ltd.
40 Armstrong Avenue
Georgetown, Ontario L7G 4R9
Telephone No:
(905) 877-0101
Fax No:
(905) 877-6666
Emergency Telephone No:
CANUTEC (613) 996-6666

HAZARDOUS INGREDIENTS OF MATERIALS

Ingredients	*%*	*TLV Units*	*CAS No.*
Phosphoric acid	*60-85*	*1 mg/m^3*	*7664-38-2*

PHYSICAL DATA

Physical State:
Liquid
Odour and Appearance:
Clear, colourless, viscous liquid, odourless
Odour Threshold (ppm):
Not applicable
Vapour Pressure (mm Hg):
2.18 mm Hg @ (20°C) (85%)
Vapour Density (Air = 1):
3.4
Evaporation Rate:
Negligible
Boiling Point (°C):
158°C
Freezing Point (°C):
21°C (85%); -17.5°C (75%)
pH:
1.5 (0.1 N, aqueous)
Specific Gravity:
1.685 (85%) @ 25°C
Coefficient of Water/Oil distribution:
Not available

SHIPPING DESCRIPTION

UN:
1805
T.D.G. Class:
8
Pkg. Group:
III

REACTIVITY DATA

Chemical Stability:
Normally stable; hygroscopic. Orthophosphoric acid gradually changes to pyrophosphoric acid at ~200°C and forms metaphosphoric acid above 300°C.
Incompatibility with other substances:
Reacts violently with strong caustics, sodium tetrahydroborate. Forms toxic, corrosive and/or flammable/explosive gases with metals, fluorides, halogenated organics, cyanides, sulphides, mercaptans, nitrides, metal phosphides, acetylides, silicides, carbides. Potentially dangerous reactions with strong oxidizing agents, reducing agents, organic peroxides. Azo compounds, epoxides, aldehydes and other polymerizable compounds can polymerize violently with phosphoric acid. Forms detonable mixture with nitromethane. Corrosive to ferrous metals and alloys, more so when hot. May corrode stainless steel when heated. May attack some plastics, rubber and coatings. May attack porcelain and graniteware when heated, earthenware and glass above 200°C.
Reactivity:
Avoid high temperatures, all incompatible materials, gneration of mist or vapour.
Hazardous Decomposition Products:
Toxic phosphorous oxides

FIRE AND EXPLOSION DATA

Flammability:
Will not burn. Reacts with most metals to produce flammable/explosive hydrogen gas. Containers may explode when heated.
Extinguishing Media:
Use an extinguisher appropriate to the surrounding fire. Use water in flooding quantities to cool containers, and knock down mist or vapours. Move containers em away from fire area if it is safe to do so. Fight fire from upwind, from a safe distance. Firefighters must wear protective equipment and clothing (encapsulating chemical splash suit) sufifcient to prevent inhalation of mists and vapours and contact with skin and eyes. Closed containers may rupture violently during fire; withdraw immediately in case of rising sound from vent or discoloration of tank.
Flash Point (Method Used):
Not applicable
Autoignition Temperature:
Not applicable
Upper Flammable Limit (% by volume):
Not applicable
Lower Flammable Limit (% by volume):
Not applicable
Hazardous Combustion Products:
PO_x
Sensitivity to Impact:
None
Sensitivity to Static discharge:
None

TOXICOLOGICAL PROPERTIES AND HEALTH DATA

Toxicological Data:
LD_{50}:
(oral, rat) 1,530 mg/kg; (dermal, rabbit) 2,740 mg/kg
LC_{50}:
(mouse) 25.5 mg/m^3 (duration not specified)
Effects of Acute Exposure to Product:
Inhaled:
Low vapour pressure, so vapours are not a problem at room temperature. If heated, releases toxic vapours. Mists may cause irritation of the eyes, nose and respiratory tract. May cause increased pulmonary resistance and transient cough. Severe overexposure can cause pulmonary edema which may be fatal. Symptoms (shortness of breath, cyanosis) may appear several hours after exposure.

In contact with skin:
Severity of injury depends on the concentration and duration of exposure. Dilute solutions may cause moderate irritation. Concentrated solutions may cause pain and severe burns to the skin (based on animal information; no human information available).
In contact with eyes:
Severity of injury depends on the concentration and duration of exposure. Concentrated solutions cause immediate pain, severe burns and permanent corneal damage which may result in blindness. Dilute solutions or mists may cause irritation (based on animal information; no human information available).
Ingested:
Not a typical route of exposure. Would be expected to cause severe burning and pain in the mouth, throat and abdomen, vomiting, diarrhea. May cause perforation of the esophagus or stomach with vomiting, severe abdominal pain, collapse and death.

Effects of Chronic Exposure to Product:
Prolonged exposure may result in decreased lung function and CNS depression. Prolonged and repeated exposure to dilute solutions may cause irritation, redness, pain and drying and cracking of the skin.
Carcinogenicity:
No human or animal information available.
Teratogenicity:
No human or animal information available.
Reproductive Effects:
No information available.
Mutagenicity:
Negative in bacterial tests.
Synergistic Products:
None known

PREVENTIVE MEASURES

Engineering Controls:
Corrosion-resistant exhaust ventilation, separate from other ventilation systems.
Respiratory Protection:
Up to 25 mg/m^3: NIOSH/OSHA approved continuous-flow supplied-air respirator. Up to 50 mg/m^3: full face-piece respirator with high-efficiency particulate filters, or full face-piece self-contained breathing apparatus, or full face-piece supplied-air respirator. Up to 1000 mg/m^3: positive-pressure, full face-piece supplied-air respirator. For higher or unknown concentrations, as in fire or spill conditions: positive-pressure, full face-piece self-contained breathing apparatus, or positive-pressure, full face-piece supplied-air respirator with an auxiliary postive-pressure self-contained breathing apparatus.
Eye Protection:
Chemical safety goggles and/or face shield.
Skin Protection:
Butyl, natural, neoprene, or nitrile rubber, polyethylene, PVC, Viton™, Barrier (PE/PA/PE), Silver Shield/4H™ (polyethylene/ethylene vinyl alcohol), Responder™, Trellchem ™HPS, Tychem™BR/LV, Tychem™ SL, Tychem™TK gloves. Other chemical-resistant protective clothing sufficient to prevent contact.
Other Personal Protective Equipment:
Safety shower and eyebath located close to chemical exposure area.
Leak and Spill Procedure:
Evacuate area. Ventilate area. Cleanup personnel must be thoroughly trained in the hazards of this material and must wear protective equipment and clothing sufficient to prevent inhalation of mists or vapours and contact with skin and eyes. Do not touch spilled material. Stop and contain discharge by constructing barriers and applying inert absorbent. Do not get water on spilled material. Contaminated absorbent may pose the same hazards as the spilled product. Neutralize with sodium bicarbonate or a mixture of soda ash/slaked lime. Collect neutralized product for recovery or disposal.
Waste Disposal:
Follow all federal, provincial and local regulations for disposal.
Handling Procedures and Equipment:
CORROSIVE. Personnel working with this product must be thoroughly trained in its hazards and its safe use, and must wear appropriate portective equipment and clothing. Use the smallest possible amount for the purpose, in designated areas with adequate ventilation. Use corrosion-resistant materials for containers and equipment. Avoid inhalation of mists or vapours. Avoid all contact. Do not use pressure to transfer liquid. Keep soda ash or lime nearby for emergency use. When diluting, always add acid to water, slowly, while stirring carefully. Practice good housekeeping - keep work area free of extraneous materials. Treat empty containers with caution - they may contain hazardous residues.
Storage Requirements:
Store in suitable, labelled containers, a cool, dry, well-ventilated area, out of direct sunlight and away from incompatible materials. Storage facilities (shelves, floors) should be constructed of corrosion-resistant materials. Protect from damage and inspect containers frequently for signs of damage, leaking or corrosion. Provide storage area with raised sills to contain leaks. Store above 21°C (85%) (4°C-80%) -18°C-75%) to prevent crystallization. Keep containers upright.

FIRST AID MEASURES

Specific Measures:
Eyes:
IMMEDIATELY flush eyes with gently running water for at least thirty (30) minutes, holding eyelids open while flushing. Take care not to flush contaminated water into unaffected eye. Wear protective gloves to avoid contact during first aid procedures. Get MEDICAL ATTENTION immediately.
Skin:
Remove contaminated clothing (including shoes, watches, belts, and rings). IMMEDIATELY flush the exposed area with large amounts of running water for at least twenty (20) minutes. Wear protective gloves to avoid contact during first aid procedures. Get medical attention immediately. Decontaminate clothing before reuse, or discard.
Inhalation:
IMMEDIATELY remove to fresh air (caution must be used by rescuers to avoid exposure to the contaminating fumes). Give oxygen and get medical attention for any breathing difficulty.
Ingestion:
DO NOT INDUCE VOMITING. If casualty is alert and not convulsing; rinse mouth with water and give 1 to 2 cups of water or milk to dilute material. IMMEDIATELY OBTAIN MEDICAL ATTENTION. If spontaneous vomiting occurs; have casualty lean forward with head down to avoid breathing in of vomitus. Rinse mouth and administer more water or milk.

REFERENCES USED

CCINFO disc: Cheminfo
Budavari: The Merck Index, 12th ed., 1997
Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987

Royal Society of Chemistry: Chemical Safety Data Sheets, Vol. 3, 1990
Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979
Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued:
March 10, 1989
Revision:
February 2012
MSDS:
8425-1, 8425-8, CAL 0432, CAL 0472
Proposed WHMIS Designation:
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