Material Safety Data Sheet
Phosphoric Acid

Section 1 - Product Identification

Synonym	:	Orthophosphoric acid.
Chemical Formula	:	H_3PO_4
Company Identification	:	Tradeasia International Pte. Limited
Address	:	133 Cecil Street # 12-03 Keck Seng Tower, Singapore Tel: +65-6227 6365 Fax: +65-6225 6286 Email: contact@chemtradeasia.com
Recommended use	:	Medicine manufacturing, paint industry, hydrogen halide synthesis, fertilizer

Section 2 – Hazards Identification

2.1. Classification
Acute Toxicity: Category 4 (Ingestion)
Corrosive to Metals: Category 1
Skin Corrosion/Irritation: Category 1
Serious Eye Damage/Irritation: Category 1

2.2. Label elements
Symbols/Pictograms

Signal Word
Danger
Hazard Statements
Harmful if swallowed.
May be corrosive to metal.
Cause serious skin burn and eye damage.
Cause serious eye damage.
Precautionary Statements
If in contact with eyes, flush with a large amount of water immediately seek medical attention.
Wear suitable protective clothing.
In case of an accident or if you feel unwell, seek medical attention immediately.

2.3. Other hazards
Not applicable

Section 3 – Composition/Information on Ingredients

3.1 Composition comments

Chemical Name	EC No/CAS No	Purity, %
Phosphoric Acid	7664-38-2	85~86

Section 4 – First-Aid Measures

4.1. Description of first aid measures

Eyes

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Avoid touching unaffected eye. Get medical aid.

Skin

Avoid direct contact with chemicals, wear chemically-resistant gloves. In case of contact, immediately flush skin with gentle water for at least 15 minutes. Remove the contaminated clothing and shoes. Seek medical attention immediately.

Wash contaminated clothing and shoes before reusal.

Ingestion

Do not give anything to the mouth to an unconscious person. So not induce vomiting. Rinse the mouth with water thoroughly. Give 240-300ml water to the patient to dilute the substance in the stomach. Seek medical attention immediately.

Inhalation

Move the patient out of the affected area. Seek medical attention immediately.

4.2. Most important symptoms and effects, both acute and delayed

Severe burning.

4.3. Indication of any immediate medical attention and special treatment needed

Consider providing oxygen if inhalation occured. Do not induce vomiting.

Section 5 – Fire Fighting Measures

5.1. Suitable Extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Specific hazards arising from the chemical

Corrosive, might generate hydrogen when in contact with metal. Hydrogen is combustible.
May release poisonous gas in case of fire.
Container might explode when exposed to high temperatures.

5.3. Special protective actions for fire-fighters

Firemen must wear full chemically protective clothing and self-contained breathing apparatus (SCBA). Use water to cool down the heated containers.

Section 6 – Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Restrict access to the area until completion of clean up. Ensure clean up is conducted by trained personnel only.Provide proper personal protective equipment.

6.2. Environmental precautions

Extinguish or eliminate all the source of ignition. Refer to the government safety and environmental protection unit. Avoid leakage into waterways.

6.3. Methods and material for containment and cleaning up

Do not touch spilled material. Avoid the leakage into the sewer or drains.
Small spill: Use Sodium bicarbonate or soda and lime to neutralize the leakage. To shovel the waste to the disposal container.
Large Spill: If safe to do so, recycle the liquid and place it in the proper cover container with a label. Use lime (Calcium oxide or soda) to carefully neutralize with recycled disposal.
Lime is the best neutralizer and will form into the low solubility of calcium phosphate. Sweep the waste in the container for discharging.

Section 7 – Handling and Storage

7.1. Precautions for safe Handling

Handle in the specific well ventilated area. Operating area must be separated from the storage area. Keep a fire extinguisher and cleaning equipment nearby. Consider installing the anti-corrosive surface equipment in the handling area. Prepare soda powder or lime nearby the working area in case of emergency. Keep the container closed when not in use. During dilution the acid should be added slowly into the water to prevent the splash.

7.2. Conditions for safe storage, including any incompatibilities

Store in the glass or other anti acidic material-made container. Avoid damage or breakage of the container. Store away from the incompatible materials. Storage area should be clean and well ventilated. Use the anti acidic flooring and approved drainage. Store the 85% liquid with the lowest temperature of 21℃; 80% liquid in the temperature of 4℃; 75% liquid with the temperature of -18℃. Avoid precipitation of the concentrate liquid.

Section 8 – Exposure Controls/Personal Protection

8.1. Appropriate engineering controls

Use the non-corrosive ventilation system. While heating the chemical or vapor generation, local exhaust ventilation might be necessary. Provide the adequate fresh air to supply the amount of gas exhausted.

8.2. Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection
Chemical protective goggles, face shield.
Skin protection
Use impervious gloves made of corrosive chemical-resistant material.
Body Protection
Overall protective clothing.
Respiratory protection

Below 25mg/m^3: Use a respiratory system with oxygen-contained breathing apparatus.
Below 50mg/m^3: NIOSH approved full-face piece with oxygen-contained and self-contained breathing apparatus and positive pressure demand or high efficiency grain filter with full-face piece breathing apparatus.
Below 1000mg/m^3: NIOSH approved full-face piece with oxygen-contained and self-contained breathing apparatus with positive pressure demand.
Unknown concentration: NIOSH approved full-face piece oxygen-contained and self-contained breathing apparatus and positive pressure demand.

Hygiene measures

Remove contaminated clothes, clean thoroughly before reuse or disposal.
Smoking, eating and drinking are prohibited in the work area.
Wash hands thoroughly after handling this substance.
Maintain a clean work environment.

Section 9 – Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Slightly viscous liquid
Appearance: Transparent
Odour: Odorless
Odour threshold: Not applicable
pH: 1.5
Vapor Pressure: 0.03 mmHg
Vapor Density: 3.4 (Air =1)
Evaporation Rate: Not available
Boiling Point: 158℃ (85%)
Melting Point: 21℃ (85%)
Decomposition Temperature: Not available
Solubility: Soluble in water
Density: 1.685@85% liquid (H_2O=1)

Section 10 – Stability and Reactivity

10.1. Reactivity

Non-reactive under normal temperatures and pressures.

10.2. Chemical stability

Stable under normal temperatures and pressures.

10.3. Possibility of hazardous reactions

Contact with strong bases (like potassium hydroxide) might cause: irritation, splash or release large amounts of heat. Contact with strong oxidizers, strong reductants or organic oxidizers may cause dangerous reactions. Contact with azo compounds, epoxide, aldehyde and other compounds may cause violent polymerization. Contact with metals may generate the flammable and potentially explosive hydrogen. Contact with fluoride, organic halide, cyanide, sulfide, mercaptan, nitride, metal phosphide, acetylene compound, silicides and calcium carbide may generate the poisonous, corrosive and flammable gases. Contact with sodium methane

may cause the sodium methane to ignite. Contact with sodium borohydride might release a large amount of heat.

10.4. Conditions to avoid:
High temperatures.

10.5. Incompatible materials
Strong oxidizing agents, strong bases, strong reductants, azo compounds, epoxide, aldehyde, metals, fluoride, organic halide, cyanide, sulfide, mercaptan, nitride, metal phosphide, acetylene compound, silicides, calcium carbide, sodium methane, sodium borohydride.

10.6. Hazardous decomposition products
Not available.

Section 11 – Toxicological Information

11.1 Health effects associated with ingredients
Acute toxicity
LD50: 1530 mg/kg (rat, oral)
Skin corrosion/irritation
Not available.
Serious eye damage/eye irritation
Droplets may cause irritation of eyes. Splash of the concentrated liquid may cause severe burns and permanent eye damage.
Respiratory or skin sensitization
Vapor or droplets may irritate the nose and throat. May cause serious irritation and redness, pain, corrosive injury and permanent scarring.
Germ cell mutagenicity
Not available.
Carcinogenicity
Not available.
Reproductive toxicity
Not available.
Specific target organ toxicity - single exposure
Not available.
Specific target organ toxicity - repeated exposure
Not available.
Symptoms
Irritation, burns, stomach ache, dyspnea, nausea, vomiting, abdominal pain, dermatitis.

Section 12 – Ecological Information

12.1.Ecotoxicity
LC50(fish)：138 mg/l/96h

12.2. Bioaccumulative potential

Not available.

12.3. Mobility in soil
If the phosphoric acid is released to soil, it will infiltrate the ground. The speed of mobility will increase with the concentration of the acid decreasing. In the process of the infiltration, phosphoric acid will dissolve some components of the soil, especially types of carbonate. It's possible that the proton or the phosphoric acid ion will be absorbed and neutralized. Most of the phosphoric acid might enter waterways.

12.4. Persistence and Degradability
Not available.

12.5. Other adverse effects
Not available.

Section 13 – Disposal Considerations

13.1. Disposal methods
Waste from residues/unused products:
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Phosphoric acid waste can be neutralized with lime and would form the fertilizer.
Disposal should be conducted by the trained personnel with proper equipment.

Section 14 – Transport Information

14.1. DOT

UN proper shipping name	UN1805
UN proper shipping name	Phosphoric Acid
Transport hazard class(es)	Corrosive substance; Category 8
Packing Group	III
Marine pollutant	No

Section 15 – Regulatory Information

15.1. Safety, health and environmental regulations
Regulated by the following (Taiwan):
1. Occupational Safety and Health Act
2. Regulations for the Labelling and Hazard Communication of Hazardous Chemicals
3. Standards of Specific Chemical Substances Hazard Prevention
4. Road Traffic Safety Regulations
5. Industrial Waste Storage and Disposal Regulations
6. Assessment and Classification Administration of Hazardous Chemicals

Section 16 : Additional Information

16.1. List of abbreviation and acronyms used in this MSDS
SDS : Safety Data Sheets

Index N° : atomic number of the element most characteristic of the properties of the substance
CAS No : Chemical Abstracts Service number
EC No : EINECS Number : European Inventory of Existing Commercial Substances
Repr. Cat. 2 : Substance presumed human reproductive toxicant
Acute Oral Cat. 5 : Substance which is of relatively low acute oral toxicity.
GHS : Globally Harmonised System of Classification and Labelling
LD_{50} : Median Lethal Dose
LC_{50} : Lethal Concentration, 50%
N.A. : Not Applicable
OSHA : Occupational Safety & Health Administration
Cal OSHA : The State of California Division of Occupational Safety and Health (DOSH)
PEL : Permissible Exposure Limits
ACGIH : American Conference of Governmental Industrial Hygienists
TLV : Threshold Limit Value
Japanese MITI : Japanese Ministry of International Trade and Industry
EC_{50} : Half maximal effective concentration
UN : United Nations
U.S. EPA TSCA Inventory: Inventory of the chemical substances manufactured or processed in the United States according to Toxic Substances Control Act compiled and published under the authority of the Environmental Protection Agency
Canadian DSL: Canadian Domestic Substances List

16.2. Disclaimer of Liability

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