

## Chemical Safety Data Sheet MSDS / SDS

## Orthophosphoric acid SDS

Revision Date:2024-04-25 Revision Number:1

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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****Product identifier**

Product name: Orthophosphoric acid

CAS: 7664-38-2

**Relevant identified uses of the substance or mixture and uses advised against**

Relevant identified uses: For R&amp;D use only. Not for medicinal, household or other use.

Uses advised against: none

**Company Identification**

Company: Chemicalbook.in

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**SECTION 2: Hazards identification****Classification of the substance or mixture**

Skin corrosion, Sub-category 1B

## GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

### Hazard statement(s)

H314 Causes severe skin burns and eye damage

### Precautionary statement(s)

### Prevention

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P264 Wash ... thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

### Response

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P363 Wash contaminated clothing before reuse.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P316 Get emergency medical help immediately.

P321 Specific treatment (see ... on this label).

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

### Storage

P405 Store locked up.

### Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

### Other hazards which do not result in classification

no data available

### SECTION 3: Composition/information on ingredients

#### Substance

Chemical name: Orthophosphoric acid

Common names and synonyms: Orthophosphoric acid

CAS number: 7664-38-2

EC number: 231-633-2

Concentration: 100%

### SECTION 4: First aid measures

#### Description of necessary first-aid measures

##### If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer immediately for medical attention.

##### Following skin contact

Wear protective gloves when administering first aid. Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer immediately for medical attention .

##### Following eye contact

Rinse with plenty of water for several minutes (remove contact lenses if easily possible). Refer immediately for medical attention.

##### Following ingestion

Rinse mouth. Give nothing to drink. Do NOT induce vomiting. Refer immediately for medical attention.

#### Most important symptoms/effects, acute and delayed

Burns on mouth and lips, sour acrid taste, severe gastrointestinal irritation, nausea, vomiting, bloody diarrhea, difficult swallowing, severe abdominal pains, thirst, acidemia, difficult breathing, convulsions, collapse, shock, death. (USCG, 1999)

#### Indication of immediate medical attention and special treatment needed, if necessary

Irrigate eyes with water; wash contaminated part of body with soap and water; gastric lavage (stomach wash) taking care not to perforate the gastrointestinal tract, if swallowed.

## SECTION 5: Firefighting measures

### Suitable extinguishing media

Use water spray to keep fire-exposed containers cool. Extinguish fire using agent suitable for surrounding fire.

### Specific hazards arising from the chemical

Excerpt from ERG Guide 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]: Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.). Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. For electric vehicles or equipment, ERG Guide 147 (lithium ion batteries) or ERG Guide 138 (sodium batteries) should also be consulted. (ERG, 2016)

### Special protective actions for fire-fighters

In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep drums, etc., cool by spraying with water. NO direct contact of the substance with water.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. Carefully collect remainder. Then wash away with plenty of water. Then store and dispose of according to local regulations.

### Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. Carefully collect remainder. Then wash away with plenty of water. Then store and dispose of according to local regulations.

### Methods and materials for containment and cleaning up

Ventilate area of spill or leak. If in the solid form, collect spilled material in the most convenient and safe manner for reclamation or for disposal in a secured sanitary landfill. If in the liquid form, collect for reclamation or absorb in vermiculite, dry sand, earth, or a similar material.

## SECTION 7: Handling and storage

### Precautions for safe handling

NO contact with incompatible materials: See Chemical Dangers Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

### Conditions for safe storage, including any incompatibilities

Dry. Well closed. Separated from food and feedstuffs and incompatible materials. See Chemical Dangers. Ventilation along the floor. Store in cool, dry, well-ventilated location. Separate from alkalis and most metals.

## SECTION 8: Exposure controls/personal protection

### Control parameters

### Occupational Exposure limit values

TLV: 1 mg/m<sup>3</sup>, as TWA; 3 mg/m<sup>3</sup> as STEL. MAK: (inhalable fraction): 2 mg/m<sup>3</sup>; peak limitation category: I(2); pregnancy risk group: C. EU-OEL: 1 mg/m<sup>3</sup> as TWA; 2 mg/m<sup>3</sup> as STEL

### Biological limit values

no data available

### Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

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

#### Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

#### Skin protection

Protective gloves. Protective clothing.

### Respiratory protection

Use ventilation, local exhaust or breathing protection.

### Thermal hazards

no data available

## SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Solid. Crystalline.
Colour:	White.
Odour:	Odorless
Melting point/freezing point:	41.1 °C. Atm. press.:Ca. 101 kPa. Remarks:Atmospheric pressure was not recorded.
Boiling point or initial boiling point and boiling range:	296.5 °C. Atm. press.:983 hPa.
Flammability:	Noncombustible Solid
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	81°C(lit.)
Auto-ignition temperature:	Not flammable (USCG, 1999)
Decomposition temperature:	213°C
pH:	pH = 1.5 (0.1 N aqueous solution)
Kinematic viscosity:	3.86 mPa.s (40% solution at 20 deg C).
Solubility:	Miscible with water

Partition coefficient n-octanol/water:	-1.436
Vapour pressure:	25.6 hPa. Temperature:112 °C.;102 hPa. Temperature:165.1 °C.;332 hPa. Temperature:207.3 °C.
Density and/or relative density:	1.65 (85%)
Relative vapour density:	3.4 (vs air)
Particle characteristics:	no data available

## SECTION 10: Stability and reactivity

### Reactivity

The substance is a medium strong acid. Reacts violently with bases. The substance violently polymerizes under the influence of azo compounds and epoxides. On combustion, forms toxic fumes of phosphorus oxides. Decomposes on contact with alcohols, aldehydes, cyanides, ketones, phenols, esters, sulfides or halogenated organics. This produces toxic fumes. Attacks many metals. This produces flammable/explosive gas (hydrogen - see ICSC 0001).

### Chemical stability

no data available

### Possibility of hazardous reactions

Not combustible. PHOSPHORIC ACID reacts exothermically with bases. May react with active metals, including such structural metals as aluminum and iron, to release hydrogen, a flammable gas. Can initiate the polymerization of certain classes of organic compounds. Reacts with cyanide compounds to release gaseous hydrogen cyanide. May generate flammable and/or toxic gases in contact with dithiocarbamates, isocyanates, mercaptans, nitrides, nitriles, sulfides, and strong reducing agents. Forms explosive mixture with nitromethane. Reacts violently with sodium tetrahydroborate. In the presence of chlorides can corrode stainless steel to form explosive hydrogen gas. Emits toxic and irritating fumes of oxides of phosphorus when heated to decomposition [Lewis, 3rd ed., 1993, p. 1029].

### Conditions to avoid

no data available

**Incompatible materials**

Reacts with metals to liberate flammable hydrogen gas.

**Hazardous decomposition products**

Combustion by-products include oxides of phosphorus.

**SECTION 11: Toxicological information****Acute toxicity**

Oral: LD50 - rat (female) - 1.7 mL/100 g body weight.

Inhalation: LC50 - rat, mouse, rabbit and guinea pig (male) - 1 217 mg/m<sup>3</sup>, concentration expressed as phosphorus.

Dermal: Dose level - rabbit - > 2 000 mg/kg bw.

**Skin corrosion/irritation**

no data available

**Serious eye damage/irritation**

no data available

**Respiratory or skin sensitization**

no data available

**Germ cell mutagenicity**

no data available

**Carcinogenicity**

no data available

**Reproductive toxicity**



no data available

#### **STOT-single exposure**

The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. Inhalation may cause asthma-like reactions (RADS). Exposure could cause asphyxiation due to swelling in the throat. Inhalation of high concentrations may cause lung oedema, but only after initial corrosive effects on the eyes and the upper respiratory tract have become manifest. Inhalation of high concentrations may cause pneumonitis. See Notes.

#### **STOT-repeated exposure**

The substance may have effects on the upper respiratory tract and lungs. This may result in chronic inflammation and reduced lung function. Mists of this strong inorganic acid are carcinogenic to humans. See Notes.

#### **Aspiration hazard**

A harmful contamination of the air will not or will only very slowly be reached on evaporation of this substance at 20°C.

## **SECTION 12: Ecological information**

#### **Toxicity**

Toxicity to fish: median lethal pH - *Lepomis macrochirus* - 3 - 3.25 pH - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - *Daphnia magna* - > 100 mg/L - 48 h.

Toxicity to algae: EC50 - *Desmodesmus subspicatus* (previous name: *Scenedesmus subspicatus*) - > 100 mg/L - 72 h.

Toxicity to microorganisms: EC50 - activated sludge of a predominantly domestic sewage - > 1 000 mg/L - 3 h. Remarks: Respiration rate.

#### **Persistence and degradability**

no data available

#### **Bioaccumulative potential**

no data available

#### **Mobility in soil**

When spilled onto soil, phosphoric acid will infiltrate downward, the rate being greater with lower concentration because of reduced viscosity. ... During transport through the soil, phosphoric acid will dissolve some of the soil material, in particular, carbonate-based materials. The acid will be neutralized to some degree with adsorption of the proton and phosphate ions also possible. However, significant amounts of acid will remain for transport. ... /If/ reaching the groundwater table, the acid will continue to move in the direction of groundwater flow. A contaminated plume will be produced with dilution and dispersion serving to reduce the acid concentration.

#### **Other adverse effects**

no data available

### **SECTION 13: Disposal considerations**

#### **Disposal methods**

#### **Product**

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

#### **Contaminated packaging**

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

### **SECTION 14: Transport information**

#### **UN Number**

ADR/RID: UN3453 (For reference only, please check.)

IMDG: UN3453 (For reference only, please check.)

IATA: UN3453 (For reference only, please check.)

#### **UN Proper Shipping Name**

ADR/RID: PHOSPHORIC ACID, SOLID (For reference only, please check.)

IMDG: PHOSPHORIC ACID, SOLID (For reference only, please check.)

IATA: PHOSPHORIC ACID, SOLID (For reference only, please check.)

**Transport hazard class(es)**

ADR/RID: 8 (For reference only, please check.)

IMDG: 8 (For reference only, please check.)

IATA: 8 (For reference only, please check.)

**Packing group, if applicable**

ADR/RID: III (For reference only, please check.)

IMDG: III (For reference only, please check.)

IATA: III (For reference only, please check.)

**Environmental hazards**

ADR/RID: No

IMDG: No

IATA: No

**Special precautions for user**

no data available

**Transport in bulk according to IMO instruments**

no data available

**SECTION 15: Regulatory information**

**Safety, health and environmental regulations specific for the product in question**

**European Inventory of Existing Commercial Chemical Substances (EINECS)**

Listed.

**EC Inventory**

Listed.

**United States Toxic Substances Control Act (TSCA) Inventory**

Listed.

**China Catalog of Hazardous chemicals 2015**

Listed.

**New Zealand Inventory of Chemicals (NZIoC)**

Listed.

**(PICCS)**

Listed.

**Vietnam National Chemical Inventory**

Listed.

**IECSC)**

Listed.

**Korea Existing Chemicals List (KECL)**

Listed.

**SECTION 16: Other information**

**Abbreviations and acronyms**

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

## References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:  
[http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:  
<http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

## Other Information

UN number 1805 is used for phosphoric acid solutions. The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. IARC considers mists of strong inorganic acid to be carcinogenic (group 1). However there is no information available on the carcinogenicity of other physical forms of this substance. Therefore no classification for carcinogenicity under GHS has been applied. NEVER pour water into this substance; when dissolving or diluting always add it slowly to the water.

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any