



Material Safety Data Sheet

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification

Product Name: PHOSPHORIC ACID (35% - 85%)
Reference Number: AST10046
Date: 30 September 2004

Use of the substance or preparation

Phosphates and fertilizers, acid cleaners, aluminum brighteners and metal phosphatizing, leather tanning, varnish, synthetic rubber, and water treatment. Food grade is used as an acidulate for cola drinks, yeast nutrient, etc. NSF International certifies phosphoric acid under Standard 60 as an acceptable drinking water treatment chemical.

Company/Undertaking Identification

Worldwide Headquarters
ASTARIS LLC
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St. Louis, Missouri 63141

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Emergency telephone: In Europe call +39 (0) 3 568 5123
In USA call CHEMTREC: 1 800 424 9300
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2. COMPOSITION/INFORMATION ON INGREDIENTS

Composition

| <u>Substance</u> | <u>CAS No.</u> | <u>%w/w</u> | <u>EINECS No.</u> | <u>Risk Phrase</u> |
|------------------|----------------|-------------|-------------------|--------------------|
| Phosphoric Acid | 7664-38-2 | 35 - 85 | 231-633-2 | R34 |
| Water | 7732-18-5 | 15 - 65 | 231-791-2 | None |

3. HAZARDS IDENTIFICATION

Classification of the substance/preparation

EC Classification Corrosive
Safety Phrase S26, S36, S37, S39

Human health effects

WARNING STATEMENTS: DANGER! CAUSES EYE AND SKIN BURNS
MAY BE HARMFUL IF SWALLOWED, CORROSIVE TO MILD STEEL

Astaris Material Safety Data Sheet

Material: Phosphoric Acid (35%-85%)

Reference No.: AST10046

Page 2 of 8

September 30, 2004

This product causes eye burns. Injury may be permanent. This product causes skin burns based on physical properties. It may not produce an immediate burning sensation upon skin contact, delaying the awareness of the worker that contact has occurred.

Breathing of vapor or mist may be irritating to the respiratory tract. This product may be harmful if swallowed. May cause nausea, vomiting, abdominal discomfort, burns, and a burning sensation (burning behind the breast bone) based on physical properties.

Environmental effects

When released into the soil, this material may leach into groundwater. When released to water, natural waters hardness minerals may readily reduce acidity. Phosphate may persist indefinitely.

4. FIRST AID MEASURES**General**

This material is an acid; treatment is symptomatic and supportive. Phosphoric acid has irritating effects to mucous membranes.

Eye contact

Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. If irritation persists, contact an ophthalmologist.

Skin contact

May cause skin irritation. Wash effected area with plenty of soap and water. Get medical attention.

Inhalation

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion

IF SWALLOWED, do NOT induce vomiting. Give victim 2-4 glasses of water to drink. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

5. FIRE FIGHTING MEASURES**Extinguishing media**

Not combustible
No special requirements

Unsuitable extinguishing media

Non-combustible
No special requirements

Exposure hazard

Not combustible.
May give off toxic fumes (oxides of phosphorus) in a fire.
May react with metals to liberate hydrogen, a flammable gas.

Protective equipment

Firefighters should wear self-contained breathing apparatus & personal protective clothing (PPE).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Avoid unnecessary exposure and remove all material from eyes, skin and clothing. Do not ingest or inhale mists of phosphoric acid.

Environmental precautions

Small quantities: Avoid discharge into the environment

Large quantities: May cause pollution. Avoid discharge into the environment. Note methods for cleaning up in the next section.

Methods for cleaning up

Contain large spills with dikes and transfer the material to appropriate containers for reclamation or disposal. Absorb remaining material or small spills with an inert material and then place in a chemical waste container. Neutralize washings with a base such as soda ash or lime. Flush residual spill area with large amounts of water.

Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

7. HANDLING AND STORAGE

Handling

Do not get in eyes, on skin, or on clothing.

Avoid breathing mist or vapor.

Do not taste or swallow.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Engineering measures

Provide natural or mechanical ventilation to minimize exposure. The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult National Fire Protection Association (NFPA) Standard 91 for design of exhaust systems.

Transfer product from drums to process in closed system (hermetically) and if not possible use effective local exhaust ventilation. Empty drums as thoroughly as possible to facilitate disposal.

For bulk transfer, purge lines with nitrogen to remove residual liquid before disconnect. When unloading bulk vehicles, personnel should wear chemical goggles and rubber or neoprene gloves. All fittings should be properly secured prior to energizing unloading system. Care should be taken to avoid acid contact when disconnecting lines/hoses after unloading.

For bulk storage type 316L stainless is recommended. Glass, polyethylene and FRP (depending on resin used) are satisfactory. Steel, aluminum and type 304 stainless are not recommended because of rapid or potential corrosion. Vessels should be vented and operated at ambient conditions. Maintenance heat (hot water preferred) may be used to prevent freezing. Dike area around storage tank with sufficient volume to hold entire tank contents.

Storage

Store in plastic, rubber-lined, or 316L stainless steel tanks designed for Phosphoric Acid. Store drums away from heat and out of direct sunlight. Store in a well-ventilated dry area away from alkalis and most metals. Store above freezing point. Contact with reactive metals, i.e. mild steel and aluminum may generate hydrogen that may form an explosive mixture in storage vessels.

Astaris Material Safety Data Sheet

Material: Phosphoric Acid (35%-85%)

Reference No.: AST10046

Page 4 of 8

September 30, 2004

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Occupational Exposure Limits**

Phosphoric acid

| <u>State</u> | <u>Standard</u> | <u>Limit</u> |
|----------------|---------------------------|---|
| Australia | Occupation Exposure Limit | 1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL |
| Austria | Occupation Exposure Limit | MAK 1 mg/m ³ 8-hr |
| Belgium | Occupation Exposure Limit | 1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL |
| Denmark | Occupation Exposure Limit | 1 mg/m ³ 8-hr. TWA |
| Finland | Occupation Exposure Limit | 1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL |
| France | Occupation Exposure Limit | VME 1 mg/m ³ VLE 3 mg/m ³ |
| Japan | Occupation Exposure Limit | 1 mg/m ³ 8-hr. |
| United Kingdom | Occupation Exposure Limit | 2 mg/m ³ STEL |
| United States | Occupation Exposure Limit | 1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL |

Respiratory protection

Avoid breathing vapor or mist. Use NIOSH/MSHA approved respiratory protection equipment (full face piece recommended) when airborne exposure limits are exceeded (see below). If used, full-face piece replaces the need for face shield and/or chemical goggles. Refer to U.S. OSHA regulations 29 CFR 1910.134 or European Standard EN 149.

Hand/Skin protection

Wear impervious protective gloves and clothing to prevent contact to skin. Wash immediately if skin is contaminated. Remove contaminated clothing promptly and launder before reuse. Clean personal protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

Eye protection

Wear chemical goggles, a face shield, and if necessary, a full face respirator when conditions warrant or exceed the Occupation Exposure Limit. Refer to U.S. OSHA regulations 29 CFR 1910.133 or European Standard EN 166.

Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

9. PHYSICAL AND CHEMICAL PROPERTIES**General information**

| | |
|-----------------------------|---------------------------------|
| Chemical Formula: | H ₃ PO ₄ |
| Appearance: | Clear, colorless, syrupy liquid |
| Odor: | None |
| Vapor Pressure (100% acid): | 0.0285 mm Hg @ 20 °C |
| Solubility in Water: | Complete |

Important health, safety and environmental information

| | <u>75%</u> | <u>80%</u> | <u>85%</u> |
|---|------------|------------|------------|
| pH (as a 1% solution @ 25 °C) | < 1 | < 1 | < 1 |
| % Equivalent H ₃ PO ₄ : | 75.1 | 80.35 | 85.5 |
| Boiling Point °C : | 135 | 144 | 154 |
| Freezing point °C | -17.5 | 4.6 | 21.1 |
| Viscosity @ 25 °C | 12 | 17 | 23 |
| Specific Gravity @ 25 °C /15.5 °C: | 1.575 | 1.633 | 1.692 |
| Kg/l @ 25 °C | 1.57 | 1.64 | 1.69 |
| lb/gallon @ 25 °C | 13.17 | 13.66 | 14.15 |

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Product is stable under normal conditions of storage and handling.

Conditions to avoid

Incompatible materials

Materials to avoid

Liberates explosive hydrogen gas when reacting chlorides and stainless. May react violently with sodium tetrahydroborate. Exothermic reactions with aldehydes, amines, amides, alcohols and glycols, azo-compounds, carbamates, esters, caustics, phenols and cresols, ketones, organophosphates, epoxides, explosives, combustible materials, unsaturated halides, and organics peroxides, phosphoric acid forms flammable gases with sulfides, mercaptans, cyanides and aldehydes. Mixture with nitromethane is explosive.

Hazardous decomposition

Phosphorus oxides may form when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Laboratory data

Data from Astaris single-dose (acute) animal studies with this material are given below:

Phosphoric Acid 75%

Oral - rat LD50: 4,400 mg/kg; slightly toxic
Dermal - rabbit LD50: > 3,160 mg/kg; slightly toxic
Eye Irritation - rabbit (24-hr. exp): corrosive
Skin Irritation - rabbit (24-hr. exp): corrosive
DOT Skin Corrosion - rabbit (4-hr. exp): non-corrosive

Phosphoric Acid 80%

Oral - rat LD50: 4,200 mg/kg; slightly toxic
Dermal - rabbit LD50: > 3,160 mg/kg; slightly toxic
Eye Irritation - rabbit (24-hr. exp): corrosive
Skin Irritation - rabbit (24-hr. exp): corrosive
DOT Skin Corrosion - rabbit (4-hr. exp): non-corrosive

Phosphoric Acid 85%

Oral - rat LD50: 3,500 mg/kg; slightly toxic
Dermal - rabbit LD50: > 1,260 mg/kg; slightly toxic
Eye Irritation - rabbit (24-hr. exp): corrosive
Skin Irritation - rabbit (24-hr. exp): corrosive
DOT Skin Corrosion - rabbit (4-hr. exp): corrosive

The results of single exposure tests indicate that these concentrations of Phosphoric Acid are slightly toxic orally and no more than slightly toxic after skin application. Following a 24-hour exposure, irreversible eye and skin damage occurred at all tested concentrations of Phosphoric Acid.

Phosphoric Acid has produced no genetic changes in standard tests using bacterial cells.

Additional Information

This material is severely corrosive to steel based on DOT, 49 CFR criteria.

Phosphoric Acid has a low vapor pressure at room temperature and is not expected to present a significant inhalation hazard under ambient conditions. Phosphoric Acid can, however, be irritating to the respiratory tract if inhaled as a mist or if the material is vaporized. The American Conference of Governmental Industrial Hygienists (ACGIH) has established a Threshold Limit Value (TLV) for Phosphoric Acid. For further information on this material, please refer to the current edition of the Documentation of The Threshold Limit Values and Biological Exposure Indices.

12. ECOLOGICAL INFORMATION

Environmental toxicity

Phosphoric acid is practically nontoxic to one species of freshwater fish. No toxicity data was located for other freshwater species, algae, or Daphnia magna in a search of the available scientific literature.

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity.

96-hr. LC50 Mosquitofish: 138 mg/L, practically nontoxic

Environmental Fate

No specific biodegradation test data was located in a search of the available scientific literature. It was reported in the literature that while acidity of this material may be reduced readily in natural waters, the phosphate may persist indefinitely.

13. DISPOSAL CONSIDERATIONS

European waste catalog number

The data provided in this section is for information only. Please apply the appropriate classification for your waste.

06 01 04 Waste from inorganic chemical processes, phosphoric and phosphorous acid

Disposal considerations

This material when discarded is a hazardous waste as defined by the U.S. Resource Conservation and Recovery Act (RCRA), 40 CFR 261.22, due to its characteristic of corrosivity, EPA hazardous waste number D002. Best Demonstrated Available Treatment (BDAT) as defined by RCRA for D002 characteristic wastes is DEACTIVATION plus meet 40 CFR 268.48 (Universal Treatment Standards) for non-CWA/non-CWA equivalent/non-Class I SDWA systems. Dispose of in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Road/Rail, Sea and Air

| | |
|--------------|---|
| IMDG/UN | Phosphoric acid, liquid, 8, UN 1805, III |
| ICAO/IATA | UN 1805, Phosphoric acid, liquid, 8, III |
| RID/ADR | UN 1805, Phosphoric acid, liquid, 8, III |
| Canadian TDG | Phosphoric acid, liquid, 8, UN 1805, III* |
| US DOT | Phosphoric acid, liquid, 8, UN 1805, III* |

Astaris Material Safety Data Sheet

Material: Phosphoric Acid (35%-85%)

Page 7 of 8

Reference No.: AST10046

September 30, 2004

*Reportable Quantity/ Reportable Limit (RQ/RL):

Canadian: Regulated limit (RL) for packages greater than or equal to 230 kg

U.S. DOT: Reportable quantity (RQ) for packages greater than or equal to 5,000 lb

15. REGULATORY INFORMATION**EC label**

Hazard symbol: corrosive
R34 Causes burns
S26 In case of contact with eyes, rinse immediately with plenty of water & seek medical advice.
S36 Wear suitable protective clothing
S37 Wear suitable protective gloves
S39 Wear eye/face protection

Chemical Inventory

| | |
|-------------|--------|
| USA TSCA | Listed |
| Canada DSL | Listed |
| EC | Listed |
| Japan | Listed |
| Australia | Listed |
| Korea | Listed |
| Philippines | Listed |
| China | Listed |

Additional information

WHMIS Classification: D2(B) - Materials Causing Other Toxic Effects
E - Corrosive Material

SARA Hazard Notification

| | |
|---|----------------|
| Hazard Categories Under Title III Rules (40 CFR 370): | Immediate |
| Section 302 Extremely Hazardous Substances: | Not Applicable |
| Section 313 Toxic Chemical(s): | Not Applicable |

CERCLA Reportable Quantity: 5,000 lbs. of phosphoric acid

Release of 5,000 lbs. or more of this product into the environment in a 24-hour period requires notification to the U.S. National Response Center (800-424-8802 or 202-426-2675). Since local, state, and federal laws vary; consult your attorney or appropriate regulatory officials for information relating to spill reporting.

FDA: Food grades of phosphoric acid are sanctioned as Generally Recognized as Safe (GRAS) by the U.S. Food and Drug Administration and is codified in 21 CFR 182.1073.

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation.

Refer to Section 11 for OSHA/HPA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

| | <u>Health</u> | <u>Fire</u> | <u>Reactivity</u> | <u>Additional Information</u> |
|-----------------------|---------------|-------------|-------------------|--|
| Suggested NFPA Rating | 3 | 0 | 0 | |
| Suggested HMIS Rating | 3 | 0 | 0 | H H = Splash goggles, gloves (nitrile rubber recommended), synthetic apron, dust and vapor respirator |

Astaris Material Safety Data Sheet

Material: Phosphoric Acid (35%-85%)

Reference No.: AST10046

Page 8 of 8

September 30, 2004

Reason for revision: Updated Section 9. Supersedes MSDS dated: May 11, 2004
Drafted in accordance with ECC Dir 2001/58/EC

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