1 Identification of substance:

Product details:
Product name: Orthophosphoric acid, 85% w/w solution in water
Stock number:
A18067
L14440
Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Orthophosphoric acid (CAS# 7664-38-2): 85%
Water (CAS# 7732-18-5): 15%
Identification number(s):
EINECS Number: 231-633-2
EU Number: 015-011-00-6

3 Hazards identification

Hazard description:

C Corrosive

Information pertaining to particular dangers for man and environment
R 34 Causes burns.
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FIRE</th>
<th>REACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Health (acute effects) = 2
Flammability = 0
Reactivity = 1

4 First aid measures

General information
Immediately remove any clothing soiled by the product.

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

(Contd. on page 2)
Material Safety Data Sheet
acc. to OSHA and ANSI

Product name: Orthophosphoric acid, 85% w/w solution in water

(Contd. of page 1)

After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents
Product is not flammable. Use fire fighting measures that suit the surrounding fire.

Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Phosphorus oxides

Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation

Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.

Measures for cleaning/collecting:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralizing agent.
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.

Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.

Information about protection against explosions and fires:
The product is not flammable

Storage
Requirements to be met by storerooms and receptacles:
No special requirements.

Information about storage in one common storage facility:
Store away from oxidizing agents.
Store away from strong bases.

(Contd. on page 3)
8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Orthophosphoric acid

<table>
<thead>
<tr>
<th></th>
<th>mg/m3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH TLV</td>
<td>1</td>
</tr>
<tr>
<td>Belgium TWA</td>
<td>1</td>
</tr>
<tr>
<td>Denmark TWA</td>
<td>1</td>
</tr>
<tr>
<td>Finland TWA</td>
<td>1</td>
</tr>
<tr>
<td>France TWA</td>
<td>1</td>
</tr>
<tr>
<td>Ireland TWA</td>
<td>2</td>
</tr>
<tr>
<td>Netherlands TWA</td>
<td>1</td>
</tr>
<tr>
<td>Sweden TWA</td>
<td>1</td>
</tr>
<tr>
<td>Switzerland TWA</td>
<td>1</td>
</tr>
<tr>
<td>United Kingdom TWA</td>
<td>2</td>
</tr>
<tr>
<td>OSHA PEL</td>
<td>1</td>
</tr>
</tbody>
</table>

Additional information: No data

Personal protective equipment

General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.

Breathing equipment:
Use suitable respirator when high concentrations are present.

Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.

Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Eye protection:
Safety glasses
Tightly sealed goggles
Full face protection

Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information

<table>
<thead>
<tr>
<th>Form</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
</tbody>
</table>
**Product name:** Orthophosphoric acid, 85% w/w solution in water

<table>
<thead>
<tr>
<th>Change in condition</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/Melting range:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Boiling point/Boiling range:</td>
<td>130-158°C (266-316°F)</td>
</tr>
<tr>
<td>Sublimation temperature / start:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Flash point:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Ignition temperature:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Decomposition temperature:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Danger of explosion:</td>
<td>Product does not present an explosion hazard.</td>
</tr>
<tr>
<td>Explosion limits:</td>
<td></td>
</tr>
<tr>
<td>Lower:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Upper:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Vapor pressure:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Density at 20°C (68°F):</td>
<td>1.7 g/cm³</td>
</tr>
<tr>
<td>Solubility in / Miscibility with Water:</td>
<td>Fully miscible</td>
</tr>
</tbody>
</table>

**10 Stability and reactivity**

*Thermal decomposition / conditions to be avoided:* Decomposition will not occur if used and stored according to specifications.

*Materials to be avoided:*
- Oxidizing agents
- Bases

*Dangerous reactions* No dangerous reactions known

*Dangerous products of decomposition:*
- Carbon monoxide and carbon dioxide
- Phosphorus oxides (e.g. P2O5)

**11 Toxicological information**

*Acute toxicity:*

*Primary irritant effect:*
- on the skin: Corrosive effect on skin and mucous membranes. Irritant to skin and mucous membranes.
- on the eye: Strong corrosive effect. Irritating effect.

*Sensitization:* No sensitizing effects known.

*Subacute to chronic toxicity:*
Phosphoric acid is corrosive and irritates skin, eyes and mucous membranes on contact. Severe burns are possible. Dilute solutions will have a reduced effect.
Product name: Orthophosphoric acid, 85% w/w solution in water

Subacute to chronic toxicity:
Corrosive materials are acutely destructive to the respiratory tract, eyes, skin and digestive tract. Eye contact may result in permanent damage and complete vision loss. Inhalation may result in respiratory effects such as inflammation, edema, and chemical pneumonitis. May cause coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. Ingestion may cause damage to the mouth, throat and esophagus. May cause skin burns or irritation depending on the severity of the exposure.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach. No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:
General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations
Product:
Recommendation
Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information
DOT regulations:

Hazard class: 8
Identification number: UN1805
Packing group: III
Proper shipping name (technical name): PHOSPHORIC ACID, LIQUID
Label corrosive

Land transport ADR/RID (cross-border)

ADR/RID class: 8 (C1) Corrosive substances
Product name: Orthophosphoric acid, 85% w/w solution in water

(Dcontd. of page 5)

Danger code (Kemler): 80
UN-Number: 1805
Packaging group: III
Description of goods: 1805 PHOSPHORIC ACID, SOLUTION

Maritime transport IMDG:

IMDG Class: 8
UN Number: 3453
Label 8
Packaging group: III
Proper shipping name: PHOSPHORIC ACID, LIQUID

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: 8
UN/ID Number: 1805
Label 8
Packaging group: III
Proper shipping name: PHOSPHORIC ACID, LIQUID

15 Regulations

Product related hazard informations:

Hazard symbols:
C Corrosive

Risk phrases:
34 Causes burns.

Safety phrases:
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
45 In case of accident or if you feel unwell, seek medical advice immediately.

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use:
For use only by technically qualified individuals.
This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.
16 Other information:  
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing MSDS:** Health, Safety and Environmental Department.  
**Contact:** Paul V. Connolly