SAFETY DATA SHEET

1. Identification

Product identifier CARUS™ 4105 WATER TREATMENT CHEMICAL
Other means of identification None.
Recommended use CARUS™ 4105 WATER TREATMENT CHEMICAL is an effective corrosion inhibitor developed specifically for use in potable and industrial water systems.
Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information
- Company name: CARUS CORPORATION
- Address: 315 Fifth Street, Peru, IL 61354, USA
- Telephone: +1 815 223-1500 - All other non-emergency inquiries about the product should be directed to the company
- E-mail: salesmkt@caruscorporation.com
- Website: www.caruscorporation.com
- Contact person: Dr. Chithambarathanu Pillai

Emergency Telephone
For Hazardous Materials [or Dangerous Goods] Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC at CHEMTREC®, USA: 001 (800) 424-9300
CHEMTREC®, Mexico (Toll-Free - must be dialed from within country): 01-800-681-9531
CHEMTREC®, Other countries: 001 (703) 527-3887

2. Hazard(s) identification

Physical hazards Corrosive to metals Category 1
Health hazards Skin corrosion/irritation Category 1B
Serious eye damage/eye irritation Category 1
OSHA defined hazards Not classified.

Label elements

Signal word Danger
Hazard statement May be corrosive to metals. Causes severe skin burns and eye damage.
Precautionary statement
Prevention Do not breathe mist or vapor. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Keep only in original container.
Response If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Absorb spillage to prevent material damage.
Storage Store locked up. Store in corrosive resistant container with a resistant inner liner.
Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

3. Composition/information on ingredients

Mixtures

None known.
4. First-aid measures

**Inhalation**
Move injured person into fresh air and keep person calm under observation. Get medical attention if symptoms occur.

**Skin contact**
Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Chemical burns must be treated by a physician.

**Eye contact**
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Hold eyelids apart. Continue rinsing. Get medical attention immediately.

**Ingestion**
Rinse mouth thoroughly with water and give large amounts of milk or water to people not unconscious. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn’t enter the lungs. Obtain medical attention and take along these instructions.

**Most important symptoms/effects, acute and delayed**
Corrosive. Prolonged contact causes serious eye and tissue damage. May cause burns in mucous membranes, throat, esophagus and stomach. Contact can cause corrosive burns, corneal damage, and blindness. Causes permanent skin damage (scarring). Causes respiratory tract burns. May cause lung edema.

**Indication of immediate medical attention and special treatment needed**
In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

**General information**
In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.

5. Fire-fighting measures

**Suitable extinguishing media**
Use fire-extinguishing media appropriate for surrounding materials.

**Unsuitable extinguishing media**
Do not use water jet as an extinguisher, as this will spread the fire.

**Specific hazards arising from the chemical**
Fire may produce irritating, corrosive and/or toxic gases.

**Special protective equipment and precautions for firefighters**
Firefighters should wear full protective clothing including self contained breathing apparatus. Structural firefighters protective clothing will only provide limited protection.

**Fire fighting equipment/instructions**
Use standard firefighting procedures and consider the hazards of other involved materials. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

**General fire hazards**
The product is non-combustible. Contact with certain metals liberates flammable gas.

6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**
DO NOT touch spilled material. Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Stay upwind. Keep out of low areas. Ensure adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid breathing mist or vapor. Use personal protection recommended in Section 8 of the SDS.

**Methods and materials for containment and cleaning up**
Should not be released into the environment.

Large Spills: Dike far ahead of liquid spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

Small Spills: Absorb spill with vermiculite or other inert material. Clean contaminated surface thoroughly. After removal flush contaminated area thoroughly with water.

Never return spills in original containers for re-use.

**Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not contaminate water.
7. Handling and storage

Precautions for safe handling
Handle and open container with care. Use only with adequate ventilation. Avoid contact with skin, eyes and clothing. Avoid breathing mist or vapor. Wash thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities
Store in corrosive resistant container with a resistant inner liner. Keep in a well-ventilated place. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep this material away from food, drink and animal feed. Use care in handling/storage. Store away from incompatible materials.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid (CAS 7664-38-2)</td>
<td>PEL</td>
<td>1 mg/m³</td>
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</tbody>
</table>

US. ACGIH Threshold Limit Values

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<tr>
<td>Phosphoric acid (CAS 7664-38-2)</td>
<td>STEL</td>
<td>3 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>1 mg/m³</td>
</tr>
</tbody>
</table>

US. NIOSH: Pocket Guide to Chemical Hazards

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Biological limit values
No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls
Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of vapors. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection
Wear approved safety glasses or goggles.

Skin protection

Hand protection
Wear protective gloves. Be aware that the liquid may penetrate the gloves. Frequent change is advisable. Suitable gloves can be recommended by the glove supplier.

Other
Wear appropriate chemical resistant clothing. Protective shoes or boots. Structural firefighters protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations. Wear chemical protective equipment that is specifically recommended by the Personal Protective Equipment manufacturer.

Respiratory protection
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Use a NIOSH/MSHA approved air purifying respirator as needed to control exposure. Consult with respiratory manufacturer to determine respirator selection, use, and limitations. Use positive pressure, air-supplied respirator for uncontrolled releases or when air purifying respirator limitations may be exceeded. Follow respirator protection program requirements (OSHA 1910.134 and ANSI Z88.2) for all respirator use.

Thermal hazards
Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations
When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Remove and isolate contaminated clothing and shoes. Handle in accordance with good industrial hygiene and safety practice. Launder contaminated clothing before reuse.

9. Physical and chemical properties

Appearance

Physical state
Liquid.

Form
Liquid.

Color
Colorless.

Odor
None.
Odor threshold: Not applicable.

pH: 2.5 ±0.5 (1 % aqueous solution)

Melting point/freezing point: < 32 °F (< 0 °C)

Initial boiling point and boiling range: Not available.

Flash point: Not available.

Evaporation rate: Not available.

Flammability (solid, gas): Not available.

Upper/lower flammability or explosive limits:
- Flammability limit - lower (%): Not available.
- Flammability limit - upper (%): Not available.
- Explosive limit - lower (%): Not available.
- Explosive limit - upper (%): Not available.

Vapor pressure: Not available.

Vapor density: Not available.

Relative density: 1.24 ±0.03 (77 °F (25 °C))

Solubility(ies):
- Solubility (water): Completely soluble.
- Partition coefficient (n-octanol/water): No data available.

Auto-ignition temperature: Not available.

Decomposition temperature: Not available.

Viscosity: Not available.

10. Stability and reactivity

Reactivity: The product is non-reactive under normal conditions of use, storage and transport.

Chemical stability: Stable at normal conditions.

Possibility of hazardous reactions: Reacts with most metals to form flammable hydrogen gas.

Conditions to avoid: Water, moisture. Heat.


11. Toxicological information

Information on likely routes of exposure:
- Inhalation: Causes severe respiratory tract irritation. High concentrations: May cause lung damage.
- Skin contact: Causes severe skin burns.
- Eye contact: Causes severe eye burns.
- Ingestion: Causes digestive tract burns.

Symptoms related to the physical, chemical and toxicological characteristics: Corrosive. Prolonged contact causes serious eye and tissue damage. May cause burns in mucous membranes, throat, esophagus and stomach. Contact can cause corrosive burns, corneal damage, and blindness. Causes permanent skin damage (scarring). Causes respiratory tract burns. May cause lung edema.

Information on toxicological effects:

Acute toxicity: Strongly corrosive.

Components | Species | Test Results
--- | --- | ---
Phosphoric acid (CAS 7664-38-2) | Rabbit | 2740 mg/kg
**Components** | **Species** | **Test Results**
--- | --- | ---
LD50 Oral Rat | 1530 mg/kg

**Skin corrosion/irritation**
- Causes severe skin burns.

**Serious eye damage/eye irritation**
- Causes severe eye damage.

**Respiratory or skin sensitization**
- Respiratory sensitization: No data available.
- Skin sensitization: No data available.

**Germ cell mutagenicity**
- No data available.

**Carcinogenicity**
- Not expected to cause cancer.

- Not listed.

**Reproductive toxicity**
- Not expected to be a reproductive hazard.

**Specific target organ toxicity - single exposure**
- No data available.

**Specific target organ toxicity - repeated exposure**
- No data available.

**Aspiration hazard**
- Not classified.

**Chronic effects**
- May cause lung damage.

### 12. Ecological information

**Ecotoxicity**
- The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid (CAS 7664-38-2)</td>
<td>Mosquitofish (Gambusia)</td>
<td>138 mg/l, 96 h</td>
</tr>
</tbody>
</table>

**Aquatic**
- Fish LC50

**Persistence and degradability**
- No data available.

**Bioaccumulative potential**
- No data available.

**Mobility in soil**
- The product is water soluble and may spread in water systems.

**Other adverse effects**
- The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

### 13. Disposal considerations

**Disposal instructions**
- Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Dispose of contents/container in accordance with local/regional/national/international regulations. Dispose in accordance with all applicable regulations.

**Hazardous waste code**
- D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
- Waste codes should be assigned by the user based on the application for which the product was used.

**Waste from residues / unused products**
- Dispose of in accordance with local regulations.

**Contaminated packaging**
- Dispose of in accordance with local regulations. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

### 14. Transport information

**DOT**
- UN number: UN3264
- UN proper shipping name: Corrosive liquid, acidic, inorganic, n.o.s. (Phosphoric acid)
- Transport hazard class(es):
  - Class: 8
  - Subsidiary risk: -
  - Label(s): 8
  - Packing group: III
Environmental hazards
  Marine pollutant: Yes

Special precautions for user:
Read safety instructions, SDS and emergency procedures before handling.

Special provisions:
IB3, T7, TP1, TP28

Packaging exceptions:
154

Packaging non bulk:
203

Packaging bulk:
241

IATA
UN number: UN3264
UN proper shipping name:
Corrosive liquid, acidic, inorganic, n.o.s. (Phosphoric acid)

Transport hazard class(es):
  Class: 8
  Subsidiary risk: -
  Label(s): 8

Packing group:
III
Environmental hazards:
Yes
ERG Code:
8L

Special precautions for user:
Read safety instructions, SDS and emergency procedures before handling.

IMDG
UN number: UN3264
UN proper shipping name:
CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Phosphoric acid)

Transport hazard class(es):
  Class: 8
  Subsidiary risk: -
  Label(s): 8

Packing group:
III
Environmental hazards:
Marine pollutant: Yes
EmS:
F-A, S-B

Special precautions for user:
Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not available.

15. Regulatory information

US federal regulations:
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)
Phosphoric acid (CAS 7664-38-2) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)
Hazard categories:
  Immediate Hazard - Yes
  Delayed Hazard - No
  Fire Hazard - No
  Pressure Hazard - No
  Reactivity Hazard - No

SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312 Hazardous chemical
Yes

SARA 313 (TRI reporting)
Not regulated.
Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
Not regulated.

Safe Drinking Water Act (SDWA)
Not regulated.

US state regulations
This product does not contain a chemical known to the State of California to cause cancer birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List
Phosphoric acid (CAS 7664-38-2)

US. New Jersey Worker and Community Right-to-Know Act
Phosphoric acid (CAS 7664-38-2)

US. Pennsylvania Worker and Community Right-to-Know Law
Phosphoric acid (CAS 7664-38-2)

US. Rhode Island RTK
Phosphoric acid (CAS 7664-38-2)

US. California Proposition 65
Not Listed.

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
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<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
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<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
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<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
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<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
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<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
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<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
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<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 13-February-2015
Revision date -
Version # 01

NFPA ratings

3 0 0
Disclaimer

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