Percarin® SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Percarin®

Recommended use of the chemical and restrictions on use: Cleaning and Disinfection of Hollow Fiber Dialyzers

Supplier: Angelini Pharma Inc.

2. HAZARDS IDENTIFICATION

GHS Classification:
- Physical: Category 2
- Health: Acute Toxicity Category 4 (oral, dermal and inhalation)
- Ecotoxicity: Skin Irritation Category 1
- Environmental: Single Exposure Category 3 (respiratory irritant).

GHS Label Elements: Danger: Contains hydrogen peroxide, acetic acid and peracetic acid.

2.1. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance: Clear, colorless liquid with pungent odor.
- Odor: May be harmful if swallowed.
- Odor Threshold: Not available
- Pungent odor.
- Viscosity: Not available
- Specific gravity: Not available
- Melting Point: 0°C
- Boiling Point: Not available
- Flash Point: Not available
- Evaporation Rate: Not available
- Octanol/Water Coefficient: Not available
- Solubility: Not applicable

2.2. RISK MANAGEMENT

Personal Precautions, Protective Equipment, and Emergency Procedures: Evacuate spill area and keep unauthorized personnel away. Present contact with the eyes, skin and clothing. Wear appropriate protective clothing. Ventilate area. Prevent contact with flammable or combustible material. Keep away from heat, flames and high temperatures. Avoid releases to the environment.

Methods and Materials for Containment and Cleaning Up: Contain and recover liquid if possible or absorb with an inert, non-combustible material such as earth, dry sand or vermiculite. Do not use combustible absorption such as sawdust. Do not return to the original container. Vent containers of recovered liquid to prevent pressurization and rupture of containers. Keep containers away from combustible material. Dilute large spills with a large amount of water and hold in a diked, well-ventilated area until the peroxide decomposes. Report releases as required by local, state and federal authorities.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>95.0%</td>
</tr>
<tr>
<td>Hydrogen Peroxide</td>
<td>7722-84-1</td>
<td>2.5%</td>
</tr>
<tr>
<td>Acetic Acid</td>
<td>64-19-7</td>
<td>2.5%</td>
</tr>
<tr>
<td>Peracetic Acid</td>
<td>21-21-0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

The exact concentration is being withheld as a trade secret.

4. FIRST AID MEASURES

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes while holding the eyelids apart. Remove contact lenses, if present and easy to do. Clean eyes thoroughly before washing with water. Continue rinsing. Wash with water for at least 15 minutes. Do not allow the liquid to dry on the eyes. May cause severe irritation of the eye. If exposed, flush eyes thoroughly with water. Repeated exposure to this liquid may cause burning and discomfort. May be harmful if swallowed, inhaled or absorbed through the skin.

Inhalation: Remove exposed containers from breathing air and flush with water. Provide artificial respiration if needed. Do not breathe. May cause severe irritation of the upper respiratory tract. If swallowed, may cause intratracheal irritation and discomfort. May be harmful if swallowed, inhaled or absorbed through the skin.

Ingestion: Do not allow the liquid to dry on the skin. May cause severe irritation of the skin. In case of exposure, flush skin with water. May cause skin irritation. Inhalation of vapor or mist may cause severe irritation of the upper respiratory tract. If swallowed, may cause intratracheal irritation and discomfort. May be harmful if swallowed, inhaled or absorbed through the skin.

5. FIRE FIGHTING MEASURES

Suitable (and Unsuitable) Extinguishing Media: Use large quantities of water. Cool fire exposed containers and fixtures with water. Do not use water until fire has been controlled and the fire does not involve any flammable material or other material that is endangered by the fire such as wood.

Specific hazards arising from the chemical: Contains hydrogen peroxide which is a strong oxidizer and may increase the flammability of combustible or flammable materials or powdered metals. If allowed to dry, solid residue may present a fire hazard. Hydrogen peroxide will not burn but decomposes to release oxygen and water which supports combustion. Contamination can cause rapid decomposition and an explosive pressure rise of the contents of the container.

Special Protective Equipment and Precautions for Fire-Fighters: Firefighters should wear protective clothing and equipment. Fire exposed containers and fixtures with water. Water spray is effective in reducing irritating vapors. Contain water used in firefighting from entering sewers or natural waterways.

Exposure Data (sensitivity to mechanical impact or static discharge): None known.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures: Evacuate spill area and keep unauthorized personnel away. Present contact with the eyes, skin and clothing. Wear appropriate protective clothing. Ventilate area. Prevent contact with flammable or combustible material. Keep away from heat, flames and high temperatures. Avoid releases to the environment.

Methods and Materials for Containment and Cleaning Up: Contain and recover liquid if possible or absorb with an inert, non-combustible material such as earth, dry sand or vermiculite. Do not use combustible absorption such as sawdust. Do not return to the original container. Vent containers of recovered liquid to prevent pressurization and rupture of containers. Keep containers away from combustible material. Dilute large spills with a large amount of water and hold in a diked, well-ventilated area until the peroxide decomposes. Report releases as required by local, state and federal authorities.

7. HANDLING AND STORAGE

Precautions for Safe Handling: Prevent contact with the eyes, skin and clothing. Do not breathe vapors or mist. Wear protective clothing and equipment. Use only with adequate exhaust ventilation. Wash thoroughly with soap and water after handling. Keep in well-ventilated areas. Keep away from heat, direct sunlight and all combustible materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines: Protective clothing: Use with adequate local or general ventilation to maintain exposure levels below the occupational exposure limits. Respiratory Protection: In operations where the occupational exposure limits are exceeded, an approved respirator with appropriate cartridges or supplied air respirator should be used. Respirator selection and use should be based on contaminant type, form and concentration. Follow applicable regulations and good industrial hygiene practice.

Skin Protection: Impervious gloves such as rubber are recommended to prevent skin contact. Eye Protection: Chemical safety goggles with face shield recommended to handle concentrate. Safety goggles recommended for use solutions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Clear, colorless liquid with a sharp pungent odor.

Physical State: Liquid

Dew Point: Not applicable

Initial Boiling Range: 100°F (38°C)

10. STABILITY AND REACTIVITY

Peracidin® SAFETY DATA SHEET

Chemical Stability: Stable under normal storage and handling conditions. Unstable when exposed to heat and contaminants. Strong oxidizers, react violently with many other materials, particularly flammable and combustible organic materials. Possibility of Hazardous Reactions: Oxidizers may react with many other materials, particularly flammable and combustible organic materials. Elevated temperatures can increase the decomposition of the product. Contact with organic substances may cause fire or explosion. Contact with metals, metallic ions, alkalies, reducing agents and organic matter (such as alcohol or terpenes) may produce self-accelerated thermal decomposition. Conditions to Avoid: Keep away from flames and high temperatures. Avoid light and heat and keep in a closed but ventilated container to prevent evaporation (concentration) and contamination. Explosive pressure rupture of the container can occur if not properly vetted. Incompatible Materials: Acids, bases, heat, reducing agents, organic materials, dirt, acids, alcohols and glycols, aldehydes, amides, amines, airo, diketones and hydrazines, carbonates, cyanides, dithiocarbamates, esters, ethers, hydrogenos, halogenated organics, rust and many metals. Hazardous Decomposition Products: Decomposition of hydrogen peroxide liberates heat and oxygen. High temperatures and the presence of combustion increases the rate of decomposition. Explosive pressure rupture of the container can occur if not properly vetted. Decomposition of acetic acid and peracetic acid will release oxides of carbon.

11. TOXICOLOGICAL INFORMATION

11.1. HEALTH HAZARDS:

Eye: Cause severe irritation with redness, tearing with possible burn. Permanent eye damage may occur.

Skin: May cause moderate to severe irritation with whitening of the skin. Peracetic acid may be harmful if absorbed through the skin.

Ingestion: Swallowing may cause pain, vomiting, diarrhea, distention of the stomach (due to rapid liberation of oxygen), and possible perforation of the stomach. Peracetic acid may be harmful if swallowed.

Inhalation: Inhalation of vapors or mists may cause severe irritation of the nose, throat and upper respiratory tract. Peracetic acid may be harmful if inhaled.

Chronic: None known.

Sensitization: This material is not known to cause sensitization.

Carcinogenicity: None of the components present are listed as a carcinogen or suspected carcinogenic by IARC, NTP, ACGIH, or OSHA.

Germ Cell Mutagenicity: Hydrogen peroxide has tested positive for mutagenicity in some test systems. Acetic acid: Acetic acid was found to be negative in the Ames test for mutagenicity. Peracetic acid was negative in in-vitro and in-vivo assays.

Reproductive Toxicity: In a 90 day reproductive oral study with mice, hydrogen peroxide showed no effects in the reproductive organs in both males and females mice. It was presumed that the rapid degradation of hydrogen peroxide on absorption and due to local effects, studies would be unlikely to reveal any specific developmental effects. Acetic acid: Suckling rats were exposed to one of three solutions, 2.6x10-6 M lead acetate, 5x10-3 M acetic acid or water, from parturition until the pups were 18 days old. Pups demonstrated above normal preweaning body weights and were significantly less active than normal in an open field by day 44.

Numerical Measures of Toxicity:

Hydrogen Peroxide: Oral rat LD50 = 1199-1207 mg/kg (35%); Skin rabbit LD50 = 2000 (35%)

Acetic Acid: Oral rat LD50 = 3310 mg/kg

5% Peracetic Acid: Oral rat LD50 = 1022 mg/kg. Skin rabbit LD50 = 1147 mg/kg. Inhalation rat LC50 = 4.1 mg/L/4 hr (as aerosol)

11.2. ECOLOGICAL INFORMATION

Ecotoxicity:

Hydrogen Peroxide: 96 hr LC50 Fathead minnow = 16.4 mg/L; 48 hr EC50 Daphnia pulic = 2.6 mg/L; 72 hr EC50 Skeletoenema costatum = 1.38 mg/L.

Acetic Acid: 96 hr LC50 Fathead minnow - 88 mg/L (static). 96 hr LC50 Bluegill sunfish = 75 mg/L; 24 hr EC50 Daphnia magna = 6000 mg/L.

Peracetic Acid: 96 hr LC50 Oncorhynchus mykiss = 0.53 mg/L; 48 hr EC50 daphnia magna = 0.73 mg/L.

This product is classified as harmful to the aquatic environment with long-term adverse effects. Releases to the environment should be avoided.

Peracetic acid, acetic acid and peracetic acid rapidly degrade in the environment.

Bioaccumulative Potential: Hydrogen peroxide is decomposed by enzymatic action and does not accumulate in cell systems. Acetic acid and peracetic acid are expected to have a low potential to bioaccumulate.

Mobility in Soil: Hydrogen peroxide degrades in soil to form oxygen and water.

Other Adverse Effects: No data available.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with local and national environmental regulations.

14. TRANSPORT INFORMATION

DOT Hazardous Materials Description:

Proper Shipping Name: Hydrogen Peroxide and peroxyacetic acid mixture, stabilized

UN Number: UN1349

Hazard Class/Packing Group: 5.1 (8), PG II

Label Required: Oxidizer, Corrosive

IMDG Shipping Name: Hydrogen Peroxide and peroxyacetic acid mixture, stabilized

IMDG Hazard Class: UN1349

UN Number: 5.1 (8); PG II

IMDG Hazard Labels Required: Oxidizer, Corrosive

IATA Shipping Name: Hydrogen Peroxide and peroxyacetic acid mixture, stabilized

IATA Hazard Class: UN1349

UN Number: 5.1 (8); PG II

IATA Hazard Labels Required: Oxidizer, Corrosive

15. REGULATORY INFORMATION

CERCLA 103 Reportable Quantity: This product has an RQ of 11.100 lbs (based on the RQ of Peroxide acid of 500 lbs present at 4.5%). Releases above the RQ must be reported to the National Response Center. Some states have more stringent reporting requirements. Report all spills in accordance with local, state, and federal regulations.

Hazard Category for Section 311/312: Acute Health, Fire Hazard

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 312 Reporting requirements: Peracetic acid 4.5%.

Section 802 Extremely Hazardous Substances (TPQ): Peroxide Acid TPQ 500 lbs.

INTERNATIONAL CHEMICAL INVENTORY STATUS:

Australia ARCN: All the components are listed.

Canada DSL: All the components are listed.

China ECLSC: All the components are listed.

European Union EINECS: All the components are listed.

Japan ENCS: All the components are listed.

Korea KECI: All the components are listed.

Philippines PICCS: All the components are listed.

New Zealand: All the components are listed.

United States TSCA: All the components are listed.

16. OTHER INFORMATION

NFPA Rating: Health = 3 Flammability = 0 Instability = 1

Special Hazards = Ox

HMDS Rating: Health = 3 Flammability = 0 Physical Hazard = 2

SIDS Date of Preparation: 08/14/2014

Disclaimer: To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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