Material Safety Data Sheet

Section 1. Product and Company Identification

Product Name       Hydrogen Peroxide 3% w/v
Product Code        VW6237
Manufacturer        EMD Chemicals Inc.
                    P.O. Box 70
                    480 Democrat Road
                    Gibbstown, NJ 08027
                    Prior to January 1, 2003 EMD Chemicals Inc. was EM Industries, Inc. or EM Science, Division of EM Industries, Inc.

Effective Date      3/4/2003
Print Date          5/3/2004

For More Information Call
856-423-6300  Technical Service
Monday-Friday: 8:00 AM - 5:00 PM

Synonym            None.

Material Uses       Laboratory Reagent

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN PEROXIDE</td>
<td>7722-84-1</td>
<td>3</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>97</td>
</tr>
</tbody>
</table>

Section 3. Hazards Identification

Physical State and Appearance
Liquid.

Emergency Overview
WARNING!
OXIDIZER.
CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE.
HARMFUL IF INHALED OR ABSORBED THROUGH SKIN.
CAUSES EYE IRRITATION.
MAY BE HARMFUL IF SWALLOWED.
MAY CAUSE RESPIRATORY TRACT AND SKIN IRRITATION.
POSSIBLE CANCER HAZARD
CONTAINS MATERIAL WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA.

Routes of Entry
Eye contact. Inhalation. Ingestion.

Potential Acute Health Effects

<table>
<thead>
<tr>
<th>Eyes</th>
<th>Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>Hazardous in case of skin contact (permeator). May be hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Hazardous in case of inhalation. May be hazardous in case of inhalation (lung irritant).</td>
</tr>
<tr>
<td>Ingestion</td>
<td>May be hazardous in case of ingestion.</td>
</tr>
</tbody>
</table>

Continued on Next Page
Potential Chronic Health Effects

Carcinogenic Effects: Classified A3 (Proven for animal.) by ACGIH [HYDROGEN PEROXIDE].

Medical Conditions Aggravated by Overexposure:

Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

### Section 4. First Aid Measures

#### Eye Contact
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

#### Skin Contact
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

#### Inhalation
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

#### Ingestion
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

### Section 5. Fire Fighting Measures

#### Flammability of the Product
Non-flammable.

#### Auto-ignition Temperature
Not applicable.

#### Flash Points
Not applicable.

#### Flammable Limits
Not applicable.

#### Products of Combustion
Not applicable.

#### Fire Hazards in Presence of Various Substances
Not applicable.

#### Explosion Hazards in Presence of Various Substances
- Risks of explosion of the product in presence of static discharge: No.
- Risks of explosion of the product in presence of mechanical impact: No.

#### Fire Fighting Media and Instructions
Not applicable.

#### Protective Clothing (Fire)
Not applicable.

#### Special Remarks on Fire Hazards
Not available.

#### Special Remarks on Explosion Hazards
Not available.

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Continued on Next Page
Section 6. Accidental Release Measures

**Small Spill and Leak**
Dilate with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

**Large Spill and Leak**
Stop leak if without risk. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

**Spill Kit Information**
No specific spill kit required for this product.

Section 7. Handling and Storage

**Handling**
Avoid contact with combustible materials.

**Storage**
Keep container tightly closed. Keep container in a cool, well-ventilated area. Separate from acids, alkalies, reducing agents and combustibles.

Section 8. Exposure Controls/Personal Protection

**Engineering Controls**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection**

<table>
<thead>
<tr>
<th>Eyes</th>
<th>Splash goggles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Lab coat.</td>
</tr>
<tr>
<td>Respiration</td>
<td>Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.</td>
</tr>
<tr>
<td>Hands</td>
<td>Gloves.</td>
</tr>
<tr>
<td>Feet</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

**Protective Clothing (Pictograms)**

**Personal Protection in Case of a Large Spill**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Product Name**
HYDROGEN PEROXIDE

**Exposure Limits**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Exposure Limits</th>
</tr>
</thead>
</table>
| HYDROGEN PEROXIDE     | **AUVA (Austria, 1995).**  
                        | Spitzenbegrenzung: 2.8 mg/m³ 8 times per shift, Period: 5 minute(s).            |
|                       | Spitzenbegrenzung: 2 ML/M3 8 times per shift, Period: 5 minute(s).              |
|                       | TWA: 1.4 mg/m³                                                            |
|                       | TWA: 1 ML/M3                                                                |
|                       | **NOHSC (Australia, 1995).**                                               |
|                       | TWA: 1.4 mg/m³                                                            |
|                       | TWA: 1 ppm                                                                  |
|                       | **Lijst Grenswaarden (Belgium, 1998).**                                     |
|                       | VL: 1.4 mg/m³                                                              |
|                       | VL: 1 ppm                                                                   |
|                       | **SUVA (Switzerland, 1997).**                                               |
|                       | Momentanwert: 2.8 mg/m³ 8 times per shift, Period: 5 minute(s).              |
|                       | Momentanwert: 2 ML/M3 8 times per shift, Period: 5 minute(s).                |
|                       | MAK: 1.4 mg/m³                                                              |
|                       | MAK: 1 ML/M3 8 times per shift, Period: 5 minute(s).                         |

Continued on Next Page
Hydrogen Peroxide 3% w/v

TWA: 1.1 mg/m³
TWA: 0.8 ppm

MAK-Werte Liste (Germany, 1998).
Spitzenbegrenzung: 2.8 mg/m³ 8 times per shift, Period: 5 minute(s).
Spitzenbegrenzung: 2 ML/M3 8 times per shift, Period: 5 minute(s).
MAK: 1.4 mg/m³
MAK: 1 ML/M3

TRGS900 (Germany, 1999).
Spitzenbegrenzung: 1.4 mg/m³
MAK: 1.4 mg/m³
MAK: 1 ML/M3

Arbejdstilsynet (Denmark, 1996).
GV: 1.4 mg/m³
GV: 1 ppm

Tyterveyslaitos (Finland, 1998).
STEL: 4.2 mg/m³
STEL: 3 ppm
TWA: 1.4 mg/m³
TWA: 1 ppm

INRS (France, 1999).
VME: 1.5 mg/m³
VME: 1 ppm

EH40-OES (United Kingdom (UK), 2000).
STEL: 2.8 mg/m³
STEL: 2 ppm
TWA: 1.4 mg/m³
TWA: 1 ppm

NAOSH (Ireland, 1999).
STEL: 3 mg/m³
STEL: 2 ppm
OEL: 1.5 mg/m³
OEL: 1 ppm

TWA: 1.5 mg/m³
TWA: 1 ppm

Secretary of Work and Social security (MX, 1994).
CCT: 3 mg/m³ Period: 15 minute(s).
CCT: 2 ppm Period: 15 minute(s).
CPT: 1.5 mg/m³ Period: 8 hour(s).
CPT: 1 ppm Period: 8 hour(s).

Arbeidstilsynet (Norway, 1996).
AN: 1.4 mg/m³
AN: 1 ppm

NZ OSH (NZ, 1994).
TWA: 1.4 mg/m³
TWA: 1 ppm

AFS (Sweden, 1996).
KTV: 3 mg/m³
KTV: 2 ppm
NGV: 1.4 mg/m³
NGV: 1 ppm

ACGIH TLV (United States, 2000).
TWA: 1.4 mg/m³
TWA: 1 ppm

NIOSH REL (United States, 2000).
TWA: 1.4 mg/m³ Period: 10 hour(s).
TWA: 1 ppm Period: 10 hour(s).

OSHA Final Rule (United States, 1989).
TWA: 1.4 mg/m³
TWA: 1 ppm

Not available.
Section 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value/l Instr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Color</td>
<td>Clear. Colorless</td>
</tr>
<tr>
<td>Physical State and Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>Not applicable</td>
</tr>
<tr>
<td>pH</td>
<td>7 to 7.5 [Neutral]</td>
</tr>
<tr>
<td>Boiling/Condensation Point</td>
<td>The lowest known value is 99.9°C (211.8°F) (Water). Weighted average: 100.07°C (212.1°F)</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>May start to solidify at -0.1°C (31.8°F) based on data for: Water. Weighted average: -1.09°C (30°F)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.01 (Water = 1)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>The highest known value is 3.2 kPa (24 mmHg) (@ 20°C) (HYDROGEN PEROXIDE).</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Volatility</td>
<td>70% (v/v). (HYDROGEN PEROXIDE.)</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>0.36 (Water) compared to (n-BUTYL ACETATE=1)</td>
</tr>
<tr>
<td>VOC</td>
<td>-27 (%)</td>
</tr>
<tr>
<td>LogKow</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in water</td>
</tr>
</tbody>
</table>

Section 10. Stability and Reactivity

| Stability and Reactivity     | The product is stable. |
| Conditions of Instability    | Sensitive to light.    |
| Incompatibility with Various Substances | Reactive with reducing agents, organic materials, metals. |
| Rem/Incompatibility          | Incompatible with ammonia, antimony salts, oils, arsenities, bromides, carbonates, chlorides, iodides, thiocyanates, ferrous salts, phosphates, tannic acid and tartrates. |
| Hazardous Decomposition      | O2                    |
| Hazardous Polymerization     | Will not occur.       |

Section 11. Toxicological Information

| RTECS Number:                | Hydrogen Peroxide   |
| Toxicity                     | Not available.      |
| Water                        | ZC0110000            |
| LD₅₀                         | Not available.      |
| LC₅₀                         | Not available.      |

Continued on Next Page
Chronic Effects on Humans

Carcinogenic Effects: Classified A3 (Proven for animal.) by ACGIH [HYDROGEN PEROXIDE].
Contains material which may cause damage to the following organs: mucous membranes, upper respiratory tract, skin, eye, lens or cornea, nose/sinuses.

Acute Effects on Humans

Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching. Hazardous in case of skin contact (permeator). May be hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Hazardous in case of inhalation. May be hazardous in case of inhalation (lung irritant). May be hazardous in case of ingestion.

Synergetic Products (Toxicologically)

Not available.

Irritancy

Draize Test: Not available.

Sensitization

Slightly hazardous in case of inhalation (lung sensitizer).

Carcinogenic Effects

Classified A3 (Proven for animal.) by ACGIH [HYDROGEN PEROXIDE].

Toxicity to Reproductive System

Not available.

Teratogenic Effects

Not available.

Mutagenic Effects

Not available.

Section 12. Ecological Information

Ecotoxicity

Not available.

BOD5 and COD

Not available.

Toxicity of the Products of Biodegradation

The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations

EPA Waste Number

D002 D001

Treatment

Specified technology-Contact your local permitted waste disposal site (TSD) for permissible treatment sites. ALWAYS CONTACT PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

Section 14. Transport Information

DOT Classification

Not available.

TDG Classification

Not available.

IMO/IMDG Classification

Not available.

ICAO/IATA Classification

Not available.

Section 15. Regulatory Information

U.S. Federal Regulations

TSCA 8(b) inventory: HYDROGEN PEROXIDE; Water
SARA 302/304/311/312 extremely hazardous substances: HYDROGEN PEROXIDE
SARA 302/304 emergency planning and notification: HYDROGEN PEROXIDE
SARA 302/304/311/312 hazardous chemicals: HYDROGEN PEROXIDE
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.
SARA 313 toxic chemical notification and release reporting: No products were found.
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: No products were found.
Clean air act (CAA) 112 regulated flammable substances: No products were found.
Clean air act (CAA) 112 regulated toxic substances: No products were found.

WHMIS (Canada) CLASS C: Oxidizing material.
Class D-2B: Material causing other toxic effects (TOXIC).

CEPA DSL: HYDROGEN PEROXIDE; Water

This product has been classified in accordance with the hazard criteria of the Controlled Product Regulations and the MSDS contains all required information.

International Regulations

EINECS HYDROGEN PEROXIDE 231-765-0
Water 231-791-2

DSCL (EEC) This product is not classified according to the EU regulations.

International Lists
Australia (NICNAS): HYDROGEN PEROXIDE; Water

Germany water class: HYDROGEN PEROXIDE

Japan (MITI): HYDROGEN PEROXIDE; Water

Korea (TCCL): HYDROGEN PEROXIDE; Water

Philippines (RA6969): HYDROGEN PEROXIDE; Water

China: No products were found.

State Regulations
Pennsylvania RTK: HYDROGEN PEROXIDE: (environmental hazard, generic environmental hazard)
Massachusetts RTK: HYDROGEN PEROXIDE
New Jersey: Hydrogen Peroxide 3% w/v
California prop. 65: No products were found.

Section 16. Other Information

National Fire Protection Association (U.S.A.)

National Fire Protection Association (U.S.A.)

Fire Hazard

Health

Specific Hazard

Changed Since Last Revision +

Notice to Reader
The statements contained herein are based upon technical data that EMD Chemicals Inc. believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EMD CHEMICALS INC. MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.