Scroll down for all Safety Data Sheets (SDS) for this product.

Total Enclosures: 2
Cover Page for Safety Data Sheet

Thank you for choosing CHEMetrics, Inc. We appreciate your business. In order to best serve your needs for accurate and complete Safety Data, we offer the following information as supplemental to the attached SDS.

SDS No.: R8510  
Version No.: 2.2  
Product Name: Phosphate CHEMets® & VACUettes® Refills and Vacu-vials® Ampoules  
Part Nos.: R-8510, R-8510A, R-8510B, R-8510C, R-8510D, K-8513 Ampoules  

Product Descriptions:  
CHEMets Refills: Sealed glass ampoules, 7 mm OD, for visual colorimetric water analysis. Each CHEMet™ ampoule contains approximately 0.5 mL of liquid reagent sealed under vacuum. Refills contain 30 ampoules, test kits contain 1 refill.  
VACUettes Refills: Sealed glass ampoules, 7 mm OD, with small glass capillary attached, for visual colorimetric water analysis. Each VACUette™ ampoule contains approximately 0.5 mL of liquid reagent sealed under vacuum. Refills contain 30 ampoules, test kits contain 1 refill.  
Vacu-vials Ampoules: Sealed glass ampoules, 13 mm OD, for instrumental colorimetric water analysis. Each Vacu-vial™ ampoule contains approximately 2 mL of liquid reagent sealed under vacuum. Test kits contain 30 ampoules.

Addendum to Section 14 Transport Information:  
Shipping container markings and labels for this product, as received, may vary from the contents of section 14 of the SDS for one or both of the following reasons:

• CHEMetrics has packaged this product as Dangerous Goods in Excepted Quantities according to IATA, US DOT, and IMDG regulations.
• CHEMetrics has packaged this product as part of a test kit or reagent set composed of various chemical reagents and elected to ship as UN 3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

In case of reshipment, it is the responsibility of the shipper to determine appropriate labels and markings in accordance with applicable transportation regulations.

Additional Information:
• “Print Date” = Revision Date (expressed as DD/MM/YYYY)  
• Test kits and reagents sets may contain additional chemical reagents. See separate SDS(s).
Phosphate CHEMets & VACUettes Refills and Vacu-vials Ampoules

CHEMetrics, Inc.

Chemwatch: 9-85024
SDS No: R-8510
Version No: 2.2

Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>Phosphate CHEMets &amp; VACUettes Refills and Vacu-vials Ampoules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>Part Nos.: R-8510, R-8510A, R-8510B, R-8510C, R-8510D, K-8513 Ampoules</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Corrosive liquids, n.o.s. (contains sulfuric acid)</td>
</tr>
<tr>
<td>Chemical formula</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>Not Available</td>
</tr>
<tr>
<td>CAS number</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Relevant identified uses of the substance or mixture and uses advised against


Details of the manufacturer/importer

<table>
<thead>
<tr>
<th>Registered company name</th>
<th>CHEMetrics, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>4295 Catlett Road, Midland, VA. 22728 United States</td>
</tr>
<tr>
<td>Telephone</td>
<td>1-540-788-9026</td>
</tr>
<tr>
<td>Fax</td>
<td>1-540-788-4856</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.chemetrics.com">www.chemetrics.com</a></td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:technical@chemetrics.com">technical@chemetrics.com</a></td>
</tr>
</tbody>
</table>

Emergency telephone number

| Association / Organisation    | ChemTel Inc.                                                  |
| Emergency telephone numbers   | 1-800-255-3924                                                |
| Other emergency telephone numbers | 401-813-248-0585                                      |

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

| GHS Classification | Metal Corrosion Category 1, Skin Corrosion/Irritation Category 1A, Serious Eye Damage Category 1, STOT - SE (Resp. Irr.) Category 3 |

Label elements

<table>
<thead>
<tr>
<th>GHS label elements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGNAL WORD</td>
<td>DANGER</td>
</tr>
</tbody>
</table>

Hazard statement(s)

| H290               | May be corrosive to metals                                      |
| H314               | Causes severe skin burns and eye damage                         |
| H318               | Causes serious eye damage                                       |
| H335               | May cause respiratory irritation                                 |

Precautionary statement(s)

Prevention

Continued...
If medical advice is needed, have product container or label at hand.

Keep out of reach of children.

Read label before use.

Do not breathe dust/fume/gas/mist/vapours/spray.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

Keep only in original container.

Precautionary statement(s) 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.

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/physician/first aider

Wash contaminated clothing before reuse.

Precautionary statement(s) Storage

Store locked up.

Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

Dispose of contents/container to authorised chemical landfill or if organic to high temperature incineration

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures.

Mixtures

<table>
<thead>
<tr>
<th>CAS No</th>
<th>%[weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7732-18-5</td>
<td>&gt;90</td>
<td>water</td>
</tr>
<tr>
<td>7664-93-9</td>
<td>9</td>
<td>sulfuric acid</td>
</tr>
<tr>
<td>12054-85-2</td>
<td>&lt;1</td>
<td>ammonium molybdate</td>
</tr>
</tbody>
</table>

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact

If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact

If skin or hair contact occurs:
- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

Inhalation

If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.
- Inhalation of vapours or aerosols (mists, fumes) may cause lung edema.
- Corrosive substances may cause lung damage (e.g. lung edema, fluid in the lungs).
- As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.
- Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.

This must definitely be left to a doctor or person authorised by him/her.

(ISC13719)

Ingestion

For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casually can comfortably drink.
- Transport to hospital or doctor without delay.

Indication of any immediate medical attention and special treatment needed

Continued...
Treat symptomatically.

For acute or short term repeated exposures to strong acids:
- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling.
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

**INGESTION:**
- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- **DO NOT** attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

**SKIN:**
- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

**EYE:**
- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjuctival cul-de-sacs. Irrigation should last at least 20-30 minutes. **DO NOT** use neutralising agents or any other additives. Several litres of saline are required.
- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist.

**SECTION 5 FIREFIGHTING MEASURES**

Extinguishing media
- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

Special hazards arising from the substrate or mixture

**Fire Incompatibility**
- None known.

Advice for firefighters

**Fire Fighting**
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- Do not approach containers suspected to be hot.

**Fire/Explosion Hazard**
- Non combustible.
- Not considered to be a significant fire risk.
- Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- May emit corrosive, poisonous fumes.

**SECTION 6 ACCIDENTAL RELEASE MEASURES**

Personal precautions, protective equipment and emergency procedures

**Minor Spills**
- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact with the substance, by using protective equipment.

**Major Spills**
- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).

**SECTION 7 HANDLING AND STORAGE**

Precautions for safe handling

**Safe handling**
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- **WARNING:** To avoid violent reaction, **ALWAYS** add material to water and **NEVER** water to material.
- Avoid smoking, naked lights or ignition sources.
- Wear impact- and splash-resistant eyewear. Break the ampoule tip only when it is completely immersed in sample. Breaking the tip in air may cause the glass ampoule to shatter.

**Other information**
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
Conditions for safe storage, including any incompatibilities

**Suitable container**
- DO NOT use aluminium or galvanised containers
- Check regularly for spills and leaks
- Lined metal can, lined metal pail can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

**Storage incompatibility**
- Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pHs of less than 7.0.
- Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts - neutralisation can generate dangerously large amounts of heat in small spaces.
- The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat.
- The addition of water to inorganic acids often generates sufficient heat in the small region of mixing to cause some of the water to boil explosively.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

**Control parameters**

**OCCUPATIONAL EXPOSURE LIMITS (OEL)**

**INGREDIENT DATA**

<table>
<thead>
<tr>
<th>Source</th>
<th>Ingredient</th>
<th>Material name</th>
<th>TWA</th>
<th>STEL</th>
<th>Peak</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
<td>sulfuric acid</td>
<td>Sulfuric acid</td>
<td>1 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>US ACGIH Threshold Limit Values (TLV)</td>
<td>sulfuric acid</td>
<td>Sulfuric acid</td>
<td>0.2 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>TLV® Basis: Putm func</td>
</tr>
<tr>
<td>US NIOSH Recommended Exposure Limits (RELs)</td>
<td>sulfuric acid</td>
<td>Battery acid, Hydrogen sulfate, Oil of vitrul, Sulfuric acid (aqueous)</td>
<td>1 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
<td>ammonium molybdate</td>
<td>Molybdenum - Soluble compounds</td>
<td>5 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>(as Mo)</td>
</tr>
<tr>
<td>US NIOSH Recommended Exposure Limits (RELs)</td>
<td>ammonium molybdate</td>
<td>Synonyms vary depending upon the specific soluble molybdenum compound.</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>See Appendix D</td>
</tr>
</tbody>
</table>

**EMERGENCY LIMITS**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>sulfuric acid</td>
<td>Sulfuric acid</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>ammonium molybdate</td>
<td>Molybdcic acid, hexaammonium salt; (Ammonium heptamolybdate)</td>
<td>2.6 mg/m³</td>
<td>29 mg/m³</td>
<td>170 mg/m³</td>
</tr>
<tr>
<td>ammonium molybdate</td>
<td>Ammonium molybdate(VI) tetrahydrate</td>
<td>2.8 mg/m³</td>
<td>11 mg/m³</td>
<td>66 mg/m³</td>
</tr>
<tr>
<td>ammonium molybdate</td>
<td>Ammonium molybdate; (Di ammonium molybdate)</td>
<td>20 mg/m³</td>
<td>20 mg/m³</td>
<td>130 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Original IDLH</th>
<th>Revised IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>sulfuric acid</td>
<td>80 mg/m³</td>
<td>15 mg/m³</td>
</tr>
<tr>
<td>ammonium molybdate</td>
<td>N.E. mg/m³ / N.E. ppm</td>
<td>1,000 mg/m³</td>
</tr>
</tbody>
</table>

**Exposure controls**

**Appropriate engineering controls**

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:
- Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly.

**Personal protection**

| Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure. |
| Chemical goggles, whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted. |
| A full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection. |
| Alternatively a gas mask may replace splash goggles and face shields. |
| Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. |

**Skin protection**

See Hand protection below
**Hands/feet protection**
- Elbow length PVC gloves
- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

**Body protection**
See Other protection below

**Other protection**
- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

**Thermal hazards**
Not Available

**Recommended material(s)**

**GLOVE SELECTION INDEX**
Glove selection is based on a modified presentation of the: "Forsberg Clothing Performance Index".
The effect(s) of the following substance(s) are taken into account in the computer-generated selection:
Phosphate CHEMets & VACUettes Refills and Vacu-vials Ampoules

<table>
<thead>
<tr>
<th>Material</th>
<th>CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEOPRENE</td>
<td>A</td>
</tr>
<tr>
<td>BUTYL</td>
<td>C</td>
</tr>
<tr>
<td>NATURAL RUBBER</td>
<td>C</td>
</tr>
<tr>
<td>NATURAL+NEOPRENE</td>
<td>C</td>
</tr>
<tr>
<td>NEOPRENE/NATURAL</td>
<td>C</td>
</tr>
<tr>
<td>NITRILE</td>
<td>C</td>
</tr>
<tr>
<td>PE</td>
<td>C</td>
</tr>
<tr>
<td>PVA</td>
<td>C</td>
</tr>
<tr>
<td>PVC</td>
<td>C</td>
</tr>
<tr>
<td>SARANEX-23</td>
<td>C</td>
</tr>
<tr>
<td>VITON</td>
<td>C</td>
</tr>
</tbody>
</table>

* CPI - Chemwatch Performance Index
  A: Best Selection
  B: Satisfactory; may degrade after 4 hours continuous immersion
  C: Poor to Dangerous Choice for other than short term immersion

**NOTE**: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation.

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

**Respiratory protection**
Type E-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.
Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

<table>
<thead>
<tr>
<th>Required Minimum Protection Factor</th>
<th>Half-Face Respirator</th>
<th>Full-Face Respirator</th>
<th>Powered Air Respirator</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 10 x ES</td>
<td>E-AUS P2</td>
<td>-</td>
<td>E-PAPR-AUS / Class 1 P2</td>
</tr>
<tr>
<td>up to 50 x ES</td>
<td>-</td>
<td>E-AUS / Class 1 P2</td>
<td>-</td>
</tr>
<tr>
<td>up to 100 x ES</td>
<td>-</td>
<td>E-2 P2</td>
<td>E-PAPR-2 P2 ^</td>
</tr>
</tbody>
</table>

^ - Full-face
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

**SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Colorless</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>Odourless</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Not Available</td>
</tr>
<tr>
<td>pH (as supplied)</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>0</td>
</tr>
<tr>
<td>Initial boiling point and boiling range (°C)</td>
<td>120</td>
</tr>
<tr>
<td>Flash point (°C)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not Available</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Vapour pressure (kPa)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Solubility in water (g/L)</td>
<td>Miscible</td>
</tr>
<tr>
<td>Vapour density (Air = 1)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Relative density (Water = 1)</td>
<td>1.06</td>
</tr>
<tr>
<td>Partition coefficient n-octanol / water</td>
<td>Not Available</td>
</tr>
<tr>
<td>Auto-ignition temperature (°C)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not Available</td>
</tr>
<tr>
<td>Viscosity (cSt)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Molecular weight (g/mol)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Taste</td>
<td>Not Available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not Available</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Not Available</td>
</tr>
<tr>
<td>Surface Tension (dyn/cm or mN/m)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Gas group</td>
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</tr>
<tr>
<td>pH as a solution</td>
<td>Not Available</td>
</tr>
<tr>
<td>VOC g/L</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**SECTION 10 STABILITY AND REACTIVITY**
SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled
The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness. Not normally a hazard due to non-volatile nature of product

Ingestion
Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident.

Skin Contact
Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. Open cuts, abraded or irritated skin should not be exposed to this material.

Eye
If applied to the eyes, this material causes severe eye damage. Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely.

Chronic
Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long term occupational exposure.

Phosphate CHEMets & VACUettes Refills and Vacu-vials Ampoules
TOXICITY
IRRITATION

Phosphate CHEMets & VACUettes Refills and Vacu-vials Ampoules

WATER
No significant acute toxicological data identified in literature search.

SULFURIC ACID
Occupational exposures to strong inorganic acid mists of sulfuric acid:

AMMONIUM MOLYBDATE
For ammonium dimolybdate: (CAS 27546-07-2) Positive reaction in 20% of experimental animals (OECD 406; GPMT according to Magnuson-Kligman

Phosphate CHEMets & VACUettes Refills and Vacu-vials Ampoules, SULFURIC ACID, AMMONIUM MOLYBDATE

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance.

Acute Toxicity
Skin Irritation/Corrosion
Carcinogenicity
Reproductivity
Serious Eye Damage/Irritation
STOT - Single Exposure
Respiratory or Skin sensitisation
STOT - Repeated Exposure
Mutagenicity
Aspiration Hazard

Legend:  - Data required to make classification available
       - Data available but does not fill the criteria for classification
       - Data Not Available to make classification

CMR STATUS

Continued...
SECTION 12 ECOLOGICAL INFORMATION

Toxicity
Ecotoxicity:
The tolerance of water organisms towards pH margin and variation is diverse. Recommended pH values for test species listed in OECD guidelines are between 6.0 and almost 9. Acute testing with fish showed 96h-LC50 at about pH 3.5. Prevent, by any means available, spillage from entering drains or water courses. DO NOT discharge into sewer or waterways.

Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>LOW (LogKOW = -1.38)</td>
</tr>
<tr>
<td>ammonium molybdate</td>
<td>LOW (BCF = 5.7)</td>
</tr>
</tbody>
</table>

Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>LOW (KOC = 14.3)</td>
</tr>
</tbody>
</table>

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Dispose of according to federal, state, and local regulations.

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant: NO

Land transport (DOT)

- UN number: 1760
- Packing group: II
- UN proper shipping name: Corrosive liquids, n.o.s. (contains sulfuric acid)
- Environmental hazard: No relevant data
- Transport hazard class(es): Class 8
- Special precautions for user: Special provisions B2, IB2, T11, TP2, TP27

Air transport (ICAO-IATA / DGR)

- UN number: 1760
- Packing group: II
- UN proper shipping name: Corrosive liquid, n.o.s. * (contains sulfuric acid)
- Environmental hazard: No relevant data
- Transport hazard class(es): ICAO/IATA Class 8
- ICAO / IATA Subrisk: Not Applicable
- ERG Code: 8
- Special precautions for user: Special provisions A3A803
- Cargo Only Packing Instructions: 855
Sea transport (IMDG-Code / GGVSee)

- **UN number**: 1760
- **Packing group**: II
- **UN proper shipping name**: CORROSIVE LIQUID, N.O.S. (contains sulfuric acid)
- **Environmental hazard**: Not Applicable
- **Transport hazard class(es)**: IMDG Class 8, IMDG Subrisk Not Applicable
- **EMS Number**: F-A, S-B
- **Special precautions for user**: Special provisions 274
- **Limited Quantities**: 1 L

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

<table>
<thead>
<tr>
<th>Source</th>
<th>Ingredient</th>
<th>Pollution Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk</td>
<td>sulfuric acid</td>
<td>Y</td>
</tr>
</tbody>
</table>

### SECTION 15 REGULATORY INFORMATION

**Safety, health and environmental regulations / legislation specific for the substance or mixture**

- water(7732-18-5) is found on the following regulatory lists
  - "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"
- sulfuric acid(7664-93-9) is found on the following regulatory lists
- ammonium molybdate(12054-85-2) is found on the following regulatory lists

### SECTION 16 OTHER INFORMATION

**Other information**

**Ingredients with multiple cas numbers**

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

[www.chemwatch.net/references](http://www.chemwatch.net/references)

The (MSDS) is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

This document is copyright. Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from CHEMWATCH. TEL (+61 3) 9572 4700.
Thank you for choosing CHEMetrics, Inc. We appreciate your business. In order to best serve your needs for accurate and complete Safety Data, we offer the following information as supplemental to the attached SDS.

**SDS No.:** S8500

**Version No.:** 2.2

**Product Name:** Activator Solution for Phosphate CHEMets®, VACUettes®, & Vacu-vials® Kits

**Part Nos.:** A-8500

**Product Descriptions:**

*Activator Solution:* Plastic bottle, contains approximately 9 mL of liquid reagent. Test kits contain one (1) bottle of solution. Activator Solution packs contain six (6) bottles of solution.

**Addendum to Section 14 Transport Information:**

Shipping container markings and labels for this product, as received, may vary from the contents of section 14 of the SDS for one or both of the following reasons:

- CHEMetrics has packaged this product as Dangerous Goods in Excepted Quantities according to IATA, US DOT, and IMDG regulations.
- CHEMetrics has packaged this product as part of a test kit or reagent set composed of various chemical reagents and elected to ship as UN 3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

In case of reshipment, it is the responsibility of the shipper to determine appropriate labels and markings in accordance with applicable transportation regulations.

**Additional Information:**

- “Print Date” = Revision Date (expressed as DD/MM/YYYY)
- Test kits and reagents sets may contain additional chemical reagents. See separate SDS(s).
Activator Solution for Phosphate CHEMets, VACUettes, & Vacu-vials Kits

CHEMetrics, Inc.

CHEMetrics: 9-77354
SDS No: 58500
Version No: 2.2
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>Activator Solution for Phosphate CHEMets, VACUettes, &amp; Vacu-vials Kits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>Part No.: A-8500</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Chemical formula</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>Not Available</td>
</tr>
<tr>
<td>CAS number</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Relevant identified uses of the substance or mixture and uses advised against


Details of the manufacturer/importer

<table>
<thead>
<tr>
<th>Registered company name</th>
<th>CHEMetrics, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>4295 Catlett Road, Midland, VA. 22728 United States</td>
</tr>
<tr>
<td>Telephone</td>
<td>1-540-788-9026</td>
</tr>
<tr>
<td>Fax</td>
<td>1-540-788-4856</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.chemetrics.com">www.chemetrics.com</a></td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:technical@chemetrics.com">technical@chemetrics.com</a></td>
</tr>
</tbody>
</table>

Emergency telephone number

<table>
<thead>
<tr>
<th>Association / Organisation</th>
<th>ChemTel Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency telephone numbers</td>
<td>1-800-255-3924</td>
</tr>
<tr>
<td>Other emergency telephone numbers</td>
<td>401-813-248-0595</td>
</tr>
</tbody>
</table>

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

| GHS Classification | Skin Corrosion/Irritation Category 1B, Serious Eye Damage Category 1, STOT - SE (Resp. Irr.) Category 3, Acute Aquatic Hazard Category 3 |

Label elements

<table>
<thead>
<tr>
<th>GHS label elements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGNAL WORD</td>
<td>DANGER</td>
</tr>
</tbody>
</table>

Hazard statement(s)

<table>
<thead>
<tr>
<th>H314</th>
<th>Causes severe skin burns and eye damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>H318</td>
<td>Causes serious eye damage</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation</td>
</tr>
<tr>
<td>H402</td>
<td>Harmful to aquatic life</td>
</tr>
</tbody>
</table>

Precautionary statement(s) Prevention

Continued...
If medical advice is needed, have product container or label at hand.

Keep out of reach of children.

Read label before use.

Do not breathe dust/fume/gas/mist/vapours/spray.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

Avoid release to the environment.

Precautionary statement(s) Response

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER/doctor/physician/first aider
P363 Wash contaminated clothing before reuse.

Precautionary statement(s) Storage

P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501 Dispose of contents/container to authorised chemical landfill or if organic to high temperature incineration

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances
See section below for composition of Mixtures

Mixtures

<table>
<thead>
<tr>
<th>CAS No</th>
<th>% [weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>10025-69-1</td>
<td>5</td>
<td>stannous chloride, dihydrate</td>
</tr>
<tr>
<td>56-81-5</td>
<td>95</td>
<td>glycerol</td>
</tr>
</tbody>
</table>

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact
If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact
If skin or hair contact occurs:
- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

Inhalation
If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

Ingestion
For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

Indication of any immediate medical attention and special treatment needed
Treat symptomatically.

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media
- Water spray or fog.
Special hazards arising from the substrate or mixture

**Fire Incompatibility**
- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

**Advice for firefighters**

**Fire Fighting**
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.

**Fire/Explosion Hazard**
- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- May emit acid smoke and corrosive fumes.

**SECTION 6 ACCIDENTAL RELEASE MEASURES**

**Personal precautions, protective equipment and emergency procedures**

**Minor Spills**
- Slippery when spilt.
  - Remove all ignition sources.
  - Clean up all spills immediately.
  - Avoid breathing vapours and contact with skin and eyes.
  - Control personal contact with the substance, by using protective equipment.

**Major Spills**
- Slippery when spilt.
  - Moderate hazard.
  - Clear area of personnel and move upwind.
  - Alert Fire Brigade and tell them location and nature of hazard.
  - Wear breathing apparatus plus protective gloves.

**SECTION 7 HANDLING AND STORAGE**

**Precautions for safe handling**

**Safe handling**
- **DO NOT** allow clothing wet with material to stay in contact with skin
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- **DO NOT** enter confined spaces until atmosphere has been checked.
- Wear impact- and splash-resistant eyewear.

**Other information**
- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.

For optimum analytical performance, store in the dark and at room temperature.

**Conditions for safe storage, including any incompatibilities**

**Suitable container**
- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polykiner drum.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

**Storage incompatibility**
- Glycerol:
  - Reacts violently with strong oxidisers, acetic anhydride, alkali metal hydrides, calcium hypochlorite, calcium oxychloride, chlorine, chromic anhydride, chromium oxides, ethylene oxide, hydrogen peroxide, phosphorous triiodide, potassium chloride, potassium permanganate, potassium peroxide, silver perchlorate, sodium hydride, sodium peroxide, sodium triiodide, sodium tetrahydroborate, is incompatible with strong acids, caustics, aliphatic amines, isocyanates, uranium fluoride
  - Is able to polymerise above 145°C
  - Avoid reaction with oxidising agents

**PACKAGE MATERIAL INCOMPATIBILITIES**
- Not Available

**SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Control parameters**

**OCCUPATIONAL EXPOSURE LIMITS (OEL)**

**INGREDIENT DATA**
GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the "Forsberg Clothing Performance Index". The effect(s) of the following substance(s) are taken into account in the computer-generated selection:

Activator Solution for Phosphate CHEMets, VACUettes, & Vacu-vials Kits

<table>
<thead>
<tr>
<th>Source</th>
<th>Ingredient</th>
<th>Material name</th>
<th>TWA</th>
<th>STEL</th>
<th>Peak</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
<td>stannous chloride, dihydrate</td>
<td>Tin, inorganic compounds</td>
<td>2 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>(as Sn) (except oxides)</td>
</tr>
<tr>
<td>US ACGIH Threshold Limit Values (TLV)</td>
<td>stannous chloride, dihydrate</td>
<td>Tin, and inorganic compounds, excluding Tin hydride, as Sn - Oxide and inorganic compounds</td>
<td>2 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>US ACGIH Threshold Limit Values (TLV)</td>
<td>stannous chloride, dihydrate</td>
<td>Tin, and inorganic compounds, excluding Tin hydride, as Sn - Metal</td>
<td>2 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>TLV Basis: Pneumocystosis (or Stannosis)</td>
</tr>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
<td>glycerol</td>
<td>Glycerin / Glycerin - Respirable fraction</td>
<td>15 mg/m³ / 5 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Total dust; (mist) / (mist)</td>
</tr>
<tr>
<td>US NIOSH Recommended Exposure Limits (RELs)</td>
<td>glycerol</td>
<td>Glycerin (anhydrous); Glycerol; Glyceryl alcohol; 1,2,3-Propanetriol; Trihydroxypropane</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>See Appendix D</td>
</tr>
</tbody>
</table>

EMERGENCY LIMITS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TWA-1</th>
<th>TWA-2</th>
<th>TWA-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>stannous chloride, dihydrate</td>
<td>Tin(ii) chloride dihydrate; (Stannous chloride dihydrate)</td>
<td>3.8 mg/m³</td>
<td>3.8 mg/m³</td>
<td>760 mg/m³</td>
</tr>
<tr>
<td>stannous chloride, dihydrate</td>
<td>Stannous chloride; (Tin(II) chloride (1:2))</td>
<td>3.2 mg/m³</td>
<td>3.2 mg/m³</td>
<td>640 mg/m³</td>
</tr>
<tr>
<td>glycerol</td>
<td>Glycerine (misted); (Glycerol; Glycerin)</td>
<td>30 mg/m³</td>
<td>310 mg/m³</td>
<td>2500 mg/m³</td>
</tr>
</tbody>
</table>

Exposure controls

- Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

- The basic types of engineering controls are:
  - Process controls which involve changing the way a job activity or process is done to reduce the risk.
  - Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly.

- Personal protection
  - Chemical goggles.
  - Full face shield may be required for supplementary but never for primary protection of eyes.
  - Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience.

- Skins protection
  - See Hand protection below

- Eye and face protection
  - Wear chemical protective gloves, e.g. PVC.
  - Wear safety footwear or safety gumboots, e.g. Rubber
  - When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

- Hands/feet protection
  - The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer.
  - Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
  - The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

- Body protection
  - See Other protection below

- Other protection
  - Overalls.
  - P.V.C. apron.
  - Barrier cream.
  - Skin cleansing cream.

- Thermal hazards
  - Not Available

Recommnded material(s)

<table>
<thead>
<tr>
<th>Material</th>
<th>CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATURAL+NEOPRENE</td>
<td>A</td>
</tr>
<tr>
<td>NITRILE</td>
<td>A</td>
</tr>
</tbody>
</table>

* CPI - Chemwatch Performance Index
A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion

Respiratory protection

Type AB-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

<table>
<thead>
<tr>
<th>Required Minimum Protection Factor</th>
<th>Half-Face Respirator</th>
<th>Full-Face Respirator</th>
<th>Powered Air Respirator</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 10 x ES</td>
<td>AB-AUS P2</td>
<td>-</td>
<td>AB-PAPR-AUS / Class 1 P2</td>
</tr>
<tr>
<td>up to 50 x ES</td>
<td>-</td>
<td>AB-AUS / Class 1 P2</td>
<td>-</td>
</tr>
<tr>
<td>up to 100 x ES</td>
<td>-</td>
<td>AB-2 P2</td>
<td>AB-PAPR-2 P2 *</td>
</tr>
</tbody>
</table>

Continued...
SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value or Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odour</td>
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<td>Odour threshold</td>
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<td>Melting point / freezing point (°C)</td>
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<td>Initial boiling point and boiling range (°C)</td>
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<td>Evaporation rate</td>
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<td>Flammability</td>
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<tr>
<td>Upper Explosive Limit (%)</td>
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<td>Lower Explosive Limit (%)</td>
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<tr>
<td>Vapour pressure (kPa)</td>
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<tr>
<td>Solubility in water (g/L)</td>
<td>Miscible</td>
</tr>
<tr>
<td>Vapour density (Air = 1)</td>
<td>3.1</td>
</tr>
<tr>
<td>Partition coefficient n-octanol / water</td>
<td>1.26</td>
</tr>
<tr>
<td>Auto-ignition temperature (°C)</td>
<td>370</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not Available</td>
</tr>
<tr>
<td>Surface Tension (dyn/cm or mN/m)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Molecular weight (g/mol)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Taste</td>
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<tr>
<td>Explosive properties</td>
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</tr>
<tr>
<td>Oxidising properties</td>
<td>Not Available</td>
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<tr>
<td>Partition coefficient n-octanol / water</td>
<td>1.26</td>
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<tr>
<td>Auto-ignition temperature (°C)</td>
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<tr>
<td>Decomposition temperature</td>
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<td>Surface Tension (dyn/cm or mN/m)</td>
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<tr>
<td>Molecular weight (g/mol)</td>
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<tr>
<td>Taste</td>
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<td>Explosive properties</td>
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<tr>
<td>Oxidising properties</td>
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<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not Available</td>
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<td>Lower Explosive Limit (%)</td>
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<tr>
<td>Vapour pressure (kPa)</td>
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<tr>
<td>Solubility in water (g/L)</td>
<td>Miscible</td>
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<tr>
<td>Vapour density (Air = 1)</td>
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<tr>
<td>VOC g/L</td>
<td>Not Available</td>
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</table>

SECTION 10 STABILITY AND REACTIVITY

Reactivity: See section 7
Chemical stability: Unstable in the presence of incompatible materials. Hazardous polymerisation will not occur.
Possibility of hazardous reactions: See section 7
Conditions to avoid: See section 7
Incompatible materials: See section 7
Hazardous decomposition products: See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled: The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. The material has NOT been classified by EC Directives or other classification systems as "harmful by inhalation". This is because of the lack of corroborating animal or human evidence.

Ingestion: The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion. The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.

Skin Contact: The material can produce chemical burns following direct contact with the skin. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Eye: The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating. It applied to the eyes, this material causes severe eye damage.

Chronic: Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.
Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compounds. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration and duration of exposure to the irritating substance.

SECTION 12 ECOLOGICAL INFORMATION

Toxicity
Harmful to aquatic organisms. For Glycerol: Log Kow: -2.66 to -2.47.
Atmospheric Fate: Glycerol is broken down in the air by hydroxyl radicals \( \bullet \) the half-life for this process is 6.8 hours. However, only a negligible amount of the substance will move to the atmospheric compartment.
Terrestrial Fate: Only a negligible amount of glycerol will move into the soil compartment, if released into the environment.
Aquatic Fate: Glycerol is considered to be readily biodegradable in the aquatic environment.

Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>glycerol</td>
<td>LOW</td>
<td>LOW</td>
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</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>glycerol</td>
<td>LOW (LogKOW = -1.76)</td>
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Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
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</thead>
<tbody>
<tr>
<td>glycerol</td>
<td>HIGH (KOC = 1)</td>
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</table>

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

| Product / Packaging disposal | Dispose of according to federal, state, and local regulations. |

SECTION 14 TRANSPORT INFORMATION

Labels Required

| Marine Pollutant | NO |

Continued...
**SECTION 15 REGULATORY INFORMATION**

Safety, health and environmental regulations / legislation specific for the substance or mixture

<table>
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<tr>
<th>Name</th>
<th>CAS No</th>
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</thead>
<tbody>
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</table>

**SECTION 16 OTHER INFORMATION**

Other information

Ingredients with multiple cas numbers

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
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</tbody>
</table>

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at: www.chemwatch.net/references

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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