SAFETY DATA SHEET
R8111 Reference electrode, Part Number 5190-4003

Section 1. Identification

Product identifier : R8111 Reference electrode, Part Number 5190-4003
Part No. (Chemical Kit) : 5190-4003
Part No. : * R8111 electrode
Reference solution

Relevant identified uses of the substance or mixture and uses advised against
Analytical chemistry.
R8111 electrode
Reference solution

Supplier/Manufacturer : Agilent Technologies Australia Pty Ltd
679 Springvale Road
Mulgrave
Victoria 3170, Australia
1800 802 402

Emergency telephone number (with hours of operation) : CHEMTREC®: (61)-290372994

Note * : This product is considered an article. This Safety Data Sheet is written based on the encapsulated substance or mixture in this article. This article, when used under reasonable conditions and in accordance with the directions for use, should not present a health hazard. The substance or mixture is encapsulated in the article. Only if released due to use or processing of the article in a manner not in accordance with the product’s directions for use it may present potential health and safety hazards.

Section 2. Hazard(s) identification

Classification of the substance or mixture

<table>
<thead>
<tr>
<th>R8111 electrode</th>
<th>Reference solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>H400</td>
<td>ACUTE AQUATIC HAZARD - Category 1</td>
</tr>
<tr>
<td>H410</td>
<td>LONG-TERM AQUATIC HAZARD - Category 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R8111 electrode</th>
<th>Reference solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>H400</td>
<td>ACUTE AQUATIC HAZARD - Category 1</td>
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<td>H410</td>
<td>LONG-TERM AQUATIC HAZARD - Category 1</td>
</tr>
</tbody>
</table>

GHS label elements

Signal word : R8111 electrode
Reference solution
WARNING

Hazard statements : R8111 electrode
Reference solution
H410 - Very toxic to aquatic life with long lasting effects.
H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention : R8111 electrode
Reference solution
P273 - Avoid release to the environment.
P273 - Avoid release to the environment.
Section 2. Hazard(s) identification

- **Response**
  - R8111 electrode: P391 - Collect spillage.
  - Reference solution: P391 - Collect spillage.

- **Storage**
  - R8111 electrode: Not applicable.
  - Reference solution: Not applicable.

- **Disposal**
  - R8111 electrode: P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
  - Reference solution: P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

- **Supplemental label elements**
  - R8111 electrode: Not applicable.
  - Reference solution: Not applicable.

- **Other hazards which do not result in classification**
  - R8111 electrode: None known.
  - Reference solution: None known.

Section 3. Composition and ingredient information

<table>
<thead>
<tr>
<th>Substance/mixture</th>
<th>R8111 electrode</th>
<th>Reference solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAS number/other identifiers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ingredient name</strong></td>
<td><strong>% (w/w)</strong></td>
<td><strong>CAS number</strong></td>
</tr>
<tr>
<td><strong>R8111 electrode</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>≥10 - ≤30</td>
<td>56-81-5</td>
</tr>
<tr>
<td>Silver chloride</td>
<td>≤5</td>
<td>7783-90-6</td>
</tr>
<tr>
<td><strong>Reference solution</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver chloride</td>
<td>≤1</td>
<td>7783-90-6</td>
</tr>
</tbody>
</table>

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

**Description of necessary first aid measures**

- **Eye contact**
  - R8111 electrode: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
  - Reference solution: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

- **Inhalation**
  - R8111 electrode: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
  - Reference solution: Remove victim to fresh air and keep at rest in a
Section 4. First aid measures

Skin contact

- **R8111 electrode**
  - Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

- **Reference solution**
  - Wash out mouth with water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion

- **R8111 electrode**
  - Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

- **Reference solution**
  - Wash out mouth with water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Most important symptoms/effects, acute and delayed

**Potential acute health effects**

- **Eye contact**: 
  - **R8111 electrode**
    - No known significant effects or critical hazards.
  - **Reference solution**
    - No known significant effects or critical hazards.

- **Inhalation**: 
  - **R8111 electrode**
    - No known significant effects or critical hazards.
  - **Reference solution**
    - No known significant effects or critical hazards.

- **Skin contact**: 
  - **R8111 electrode**
    - No known significant effects or critical hazards.
  - **Reference solution**
    - No known significant effects or critical hazards.

- **Ingestion**: 
  - **R8111 electrode**
    - No known significant effects or critical hazards.
  - **Reference solution**
    - No known significant effects or critical hazards.
Section 4. First aid measures

Over-exposure signs/symptoms

Eye contact: 
- **R8111 electrode**
- **Reference solution**

Inhalation: 
- **R8111 electrode**
- **Reference solution**

Skin contact: 
- **R8111 electrode**
- **Reference solution**

Ingestion: 
- **R8111 electrode**
- **Reference solution**

Protection of first-aiders: 
No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Reference solution: 
No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to physician: 
- **R8111 electrode**
  - Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- **Reference solution**
  - Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments: 
- **R8111 electrode**
  - No specific treatment.
- **Reference solution**
  - No specific treatment.

Protection of first-aiders: 
No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Reference solution: 
No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Indication of immediate medical attention and special treatment needed, if necessary

See toxicological information (Section 11)

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media: 
- **R8111 electrode**
  - Use an extinguishing agent suitable for the surrounding fire.
- **Reference solution**
  - Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media: 
- **R8111 electrode**
  - None known.
- **Reference solution**
  - None known.

Specific hazards arising from the chemical: 
- **R8111 electrode**
  - In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- **Reference solution**
  - In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products: 
- **R8111 electrode**
  - Decomposition products may include the following materials:
    - carbon dioxide
    - carbon monoxide
    - halogenated compounds
    - metal oxide/oxides
- **Reference solution**
  - Decomposition products may include the following materials:

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Version: 3
Section 5. Firefighting measures

Special protective actions for fire-fighters:

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Reference solution:

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Special protective equipment for fire-fighters:

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Hazchem code:

• 3Z

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

Reference solution:

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders:

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Reference solution:

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions:

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Reference solution:

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.
Section 6. Accidental release measures

Methods and material for containment and cleaning up

Methods for cleaning up

- Reference solution: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Reference solution: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Reference solution: Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene

- Reference solution: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Reference solution: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

- Reference solution: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.
**Section 7. Handling and storage**

Reference solution

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

**Section 8. Exposure controls and personal protection**

**Control parameters**

**Occupational exposure limits**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8111 electrode</td>
<td>Safe Work Australia (Australia, 1/2014).</td>
</tr>
<tr>
<td></td>
<td>TWA: 10 mg/m³ 8 hours.</td>
</tr>
<tr>
<td>Glycerol</td>
<td>ACGIH TLV (United States).</td>
</tr>
<tr>
<td></td>
<td>TWA: 0.1 mg/m³, (Silver.)</td>
</tr>
<tr>
<td></td>
<td>Form: Dust and fumes</td>
</tr>
<tr>
<td>Silver chloride</td>
<td></td>
</tr>
<tr>
<td>Reference solution</td>
<td></td>
</tr>
<tr>
<td>Silver chloride</td>
<td></td>
</tr>
</tbody>
</table>

**Appropriate engineering controls**

- Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

**Environmental exposure controls**

- Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

**Individual protection measures**

**Hygiene measures**

- Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**

- Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

**Skin protection**

**Hand protection**

- Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body protection**

- Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Section 8. Exposure controls and personal protection

**Other skin protection**: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection**: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

**Appearance**

<table>
<thead>
<tr>
<th>Property</th>
<th>R8111 electrode</th>
<th>Reference solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical state</strong></td>
<td>Liquid.</td>
<td>Liquid.</td>
</tr>
<tr>
<td><strong>Colour</strong></td>
<td>White.</td>
<td>White.</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Odour threshold</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Melting point</strong></td>
<td>-25°C (-13°F)</td>
<td>0°C (32°F)</td>
</tr>
<tr>
<td><strong>Boiling point</strong></td>
<td>110°C (230°F)</td>
<td>100°C (212°F)</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Lower and upper explosive limits</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Vapour pressure</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Vapour density</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>1.1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Auto-ignition temperature</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>
Section 10. Stability and reactivity

Reactivity: 
- R8111 electrode: No specific test data related to reactivity available for this product or its ingredients.
- Reference solution: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: 
- R8111 electrode: The product is stable.
- Reference solution: The product is stable.

Possibility of hazardous reactions: 
- R8111 electrode: Under normal conditions of storage and use, hazardous reactions will not occur.
- Reference solution: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: 
- R8111 electrode: No specific data.
- Reference solution: No specific data.

Incompatible materials: 
- R8111 electrode: May react or be incompatible with oxidising materials.
- Reference solution: May react or be incompatible with oxidising materials.

Hazardous decomposition products: 
- R8111 electrode: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Reference solution: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>LD50 Oral Rat</td>
<td>12600 mg/kg &lt;5000 mg/kg</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Silver chloride</td>
<td>LD50 Oral Rat</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Irritation/Corrosion

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
</tbody>
</table>

Sensitisation
Not available.

Mutagenicity
Not available.

Carcinogenicity
Not available.

Reproductive toxicity
Not available.

Teratogenicity

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Section 11. Toxicological information

Not available.

Specific target organ toxicity (single exposure)
Not available.

Specific target organ toxicity (repeated exposure)
Not available.

Aspiration hazard
Not available.

Information on likely routes of exposure

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>R8111 Electrode</th>
<th>Reference Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

Potential acute health effects

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>R8111 Electrode</th>
<th>Reference Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye contact</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

Symptoms related to the physical, chemical and toxicological characteristics

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>R8111 Electrode</th>
<th>Reference Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye contact</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>R8111 Electrode</th>
<th>Reference Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential immediate effects</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Potential delayed effects</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Long term exposure

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>R8111 Electrode</th>
<th>Reference Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential immediate effects</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Potential delayed effects</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Potential chronic health effects

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>R8111 Electrode</th>
<th>Reference Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Teratogenicity</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Developmental effects</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

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R8111 Reference electrode, Part Number 5190-4003
Section 11. Toxicological information

Fertility effects: No known significant effects or critical hazards.
Reference solution: No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates
Not available.

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8111 electrode</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>Acute LC50 54000 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>Silver chloride</td>
<td>Acute LC50 5.3 µg/l Fresh water</td>
<td>Fish - Lepidocephalichthys guntea</td>
<td>96 hours</td>
</tr>
<tr>
<td>Reference solution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver chloride</td>
<td>Acute LC50 5.3 µg/l Fresh water</td>
<td>Fish - Lepidocephalichthys guntea</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP_{ow}</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8111 electrode</td>
<td>-1.76</td>
<td>70</td>
<td>low</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Silver chloride</td>
<td></td>
<td>70</td>
<td>low</td>
</tr>
<tr>
<td>Reference solution</td>
<td></td>
<td>70</td>
<td>low</td>
</tr>
<tr>
<td>Silver chloride</td>
<td></td>
<td>-</td>
<td>low</td>
</tr>
</tbody>
</table>

Mobility in soil

<table>
<thead>
<tr>
<th>Soil/water partition coefficient (K_{OC})</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil/water partition coefficient (K_{OC})</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Other adverse effects: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spill material and runoff and contact with soil, waterways, drains and sewers.

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Section 14. Transport information

Regulatory information

ADG / IMDG / IATA: Not regulated as Dangerous Goods according to the ADG Code.

Transport in bulk according to Annex II of Marpol and the IBC Code: Not available.

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

Standard Uniform Schedule of Medicine and Poisons
Not regulated.

Model Work Health and Safety Regulations - Scheduled Substances
No listed substance

Australia inventory (AICS): All components are listed or exempted.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals
Not listed.

Montreal Protocol (Annexes A, B, C, E)
Not listed.

Stockholm Convention on Persistent Organic Pollutants
Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)
Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals
Not listed.

International lists

National inventory

Canada: All components are listed or exempted.
China: All components are listed or exempted.
Europe: All components are listed or exempted.
Japan: Japan inventory (ENCS): All components are listed or exempted. Japan inventory (ISHL): All components are listed or exempted.
Malaysia: All components are listed or exempted.
New Zealand: All components are listed or exempted.
Philippines: All components are listed or exempted.
Republic of Korea: All components are listed or exempted.
Taiwan: All components are listed or exempted.
Turkey: Not determined.
United States: All components are listed or exempted.
Section 16. Any other relevant information

History

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Key to abbreviations

ADG = Australian Dangerous Goods
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
NOHSC = National Occupational Health and Safety Commission
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R8111 electrode</strong></td>
<td></td>
</tr>
<tr>
<td>Aquatic Acute 1, H400</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Aquatic Chronic 1, H410</td>
<td>Calculation method</td>
</tr>
<tr>
<td><strong>Reference solution</strong></td>
<td></td>
</tr>
<tr>
<td>Aquatic Acute 1, H400</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Aquatic Chronic 1, H410</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

References

Not available.

Note *

This product is considered an article. This Safety Data Sheet is written based on the encapsulated substance or mixture in this article. This article, when used under reasonable conditions and in accordance with the directions for use, should not present a health hazard. The substance or mixture is encapsulated in the article. Only if released due to use or processing of the article in a manner not in accordance with the product’s directions for use it may present potential health and safety hazards.

Notice to reader

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