1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : Reference electrode solution for Diamond electrode
NAME OF SUPPLIER : GL Sciences Inc.
ADDRESS : 22-1 Nishishinjuku 6-chome Shinjuku-ku Tokyo 163-1130, Japan
CHARGE SECTION : International Sales Section
TELEPHONE No. : +81-3-5323-6620
FACSIMILE No. : +81-3-5323-6621
SDS No. : 6001-0003

Research use only.

2. HAZARDS IDENTIFICATION

GHS CLASSIFICATION:

- Flammable liquids : Category 2
- Acute toxicity - dermal - : Category 3
- Eye damage/irritation : Category 2A
- Germ cell mutagenicity : Category 2
- Specific target organ toxicity (Single exposure) : Category 1(central nervous system, respiratory organs)
- Specific target organ toxicity (Repeated exposure) : Category 2(central nervous system, respiratory organs, haemal system, kidneys, liver)
- Hazardous to the aquatic environment - Acute hazard : Category 2
- Hazardous to the aquatic environment - Chronic hazard : Category 2

HAZARD SYMBOL:

SIGNAL WORD : Danger

HAZARD STATEMENTS:

- H225 Highly flammable liquid and vapour
- H311 Toxic in contact with skin
- H319 Cause serious eye irritation
- H341 Suspected of causing genetic defects
- H370 Cause damage to organs (central nervous system, respiratory organs)
- H373 May cause damage to organs through prolonged or repeated exposure (central nervous system, respiratory organs, haemal system, kidneys, liver)
- H401 Toxic to aquatic life
- H411 Toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS:

- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat/sparks/open flames/hot surfaces. –No smoking.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P241 Use explosion-proof electrical/ventilating/lighting/equipment.
- P242 Use only non-sparking tools.
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe fume/gas/mist/vapours.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P264 Wash hands thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P273 Avoid release to the environment.
PRODUCT NAME: Reference electrode solution for Diamond electrode

P303+P361+P353 IF ON SKIN: Take off immediately all contaminated clothing. Rinse skin with water/shower.

P370+P378 In case of fire: Use appropriate media such as chemical powder or carbon dioxide to extinguish.

P312 Call a POISON CENTER or doctor if you feel unwell.

P361+P364 Take off immediately all contaminated cloth and wash it before reuse.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+P313 If eye irritation persists: Get medical attention.

P308+P313 IF exposed or concerned: Get medical attention.

P314 Get medical attention if you feel unwell.

P403+P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

P501 Dispose of contents/container in accordance with all applicable regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL IDENTITY</th>
<th>CONTENT</th>
<th>CHEMICAL FORMULA</th>
<th>CAS No.</th>
<th>TSCA INVENTORY</th>
<th>EINECS No.</th>
<th>EC INDEX No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetonitrile</td>
<td>95.63 %</td>
<td>CH3CN</td>
<td>75-05-8</td>
<td>Listed</td>
<td>200-835-2</td>
<td>608-001-00-3</td>
</tr>
<tr>
<td>Silver (I) nitrate</td>
<td>0.207 %</td>
<td>AgNO3</td>
<td>7761-88-8</td>
<td>Listed</td>
<td>231-853-9</td>
<td>047-001-00-2</td>
</tr>
<tr>
<td>Tetrabutylammonium Perchlorate (TBAP)</td>
<td>4.16 %</td>
<td>C16H36ClNO4</td>
<td>1923-70-2</td>
<td>Listed</td>
<td>217-655-5</td>
<td>Not established</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

GENERAL ADVICE: Consult a physician. Show this safety data sheet to the doctor in attendance.

INHALATION: Move victim to fresh air. If breathing is difficult, give oxygen. Consult a physician.

SKIN CONTACT: Remove contaminated clothes and shoes, rinse skin with plenty of water or shower. Use soap to help assure removal. If irritation persists, consult a physician.

EYE CONTACT: If possible, remove any contact lenses. Flush eyes well with flooding large amounts of running water for at least 15 minutes. Assure adequate flushing by separating the eyelids with sterile fingers. Consult a physician immediately.

INGESTION: Rinse mouth, give plenty of water to dilute the substance. Do not induce vomiting. Never give anything by mouth to an unconscious person. Consult a physician immediately.

MOST IMPORTANT SYMPTOMS AND EFFECTS: May irritate to skin, eyes, respiratory systems. May induce unconsciousness, blindness, death and headache.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

FIRE & EXPLOSION HAZARDS: Toxic, irritating, dust/fume/smoke may be emitted. Carbon monoxide may be foamed.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Firemen should wear normal protective equipment(full bunker gear) and positive-pressure self-contained breathing apparati.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Remove ignition sources and ventilate the area. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid raising dust and avoid contact with skin and eyes.

ENVIRONMENTAL PRECAUTIONS: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

METHODS FOR CLEAN UP: Do not touch spilled material without suitable protection. After material is completely wipe down, wash the spill site with soap and water and ventilate the area. Pull all wastes in a container for disposal and seal it tightly. Remove, clean, or dispose contaminated clothing.
7. HANDLING AND STORAGE

HANDLING: Keep away from ignition sources and ventilate the area. No smoking. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid contact with eyes, skin, and clothing. Avoid inhalation of vapour or mist. Avoid prolonged or repeated exposure. Handle this product with suitable protection.

STORAGE: Store away from sunlight, heat and all ignition sources in well-ventilated dry place. Keep container tightly closed.

INCOMPATIBLE PRODUCTS: Strong oxidizers, acids

8. EXPOSURE CONTROL/PERSONAL PROTECTION

ENGINEERING MEASURES: Use exhaust ventilation to keep airborne concentrations below exposure limits. Use adequate ventilation.

VENTILATION: Local Exhaust; Necessary, Mechanical(General); Necessary

PERSONAL PROTECTION:
- Respiratory protection: Use respirators approved under appropriate government standards and follow all regulations.
- HAND PROTECTION: Chemical resistant gloves
- EYE PROTECTION: Safety glasses(goggles)
- SKIN PROTECTION: Protective clothing

CONTROL PARAMETERS

<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>ACGIH TLV-TWA</th>
<th>OSHA PEL-TWA</th>
<th>NIOSH REL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetonitrile</td>
<td>20 ppm</td>
<td>40 ppm</td>
<td>20 ppm</td>
</tr>
<tr>
<td>Silver (I) nitrate</td>
<td>0.01 mg/m^3 as Ag</td>
<td>0.01 mg/m^3 as Ag</td>
<td>0.01 mg/m^3 as Ag</td>
</tr>
<tr>
<td>TBAP</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless, clear liquid

ODOR: Characteristic odor

pH: No data available

BOILING POINT: approx. 82 °C (MeCN)

MELTING POINT: -45 °C (MeCN)

FLASH POINT: 12.8 °C (TCC) (MeCN)

EXPLOSIVE LIMITS: 3.0 % (lower), 16.0 % (upper) (MeCN)

VAPOR PRESSURE: 87 mmHg (at 24 °C) (MeCN)

VAPOR DENSITY: 1.4 (MeCN)

SPECIFIC GRAVITY: 0.780 - 0.784 (MeCN)

SOLUBILITY IN
- Water: Miscible
- Organic solvent: Miscible with ethanol, diethylether

PARTITION COEFFICIENT; n-octanol/water: -0.34 (MeCN)

AUTOIGNITION TEMPERATURE: 4524 °C (MeCN)

DECOMPOSITION TEMPERATURE: No data available

10. STABILITY AND REACTIVITY

REACTIVITY: Acetonitrile may be decomposed by heating higher than 120 °C, then may emitted "cyanohydrin".

CHEMICAL STABILITY: No data available

CONDITION TO AVOID: Sunlight, heat, open flames, high temperature, sparks, static electrical charge

INCOMPATIBLE MATERIALS: Oxidizers and strong acids, reductants, basic solutions

HAZARDOUS DECOMPOSITION PRODUCTS: CO, CO₂, HCN, Cyanohydrin, NOx

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY -dermal-

SKIN CORROSION/IRRITATION: This product is not classified.

EYE DAMAGE/EYE IRRITATION (MeCN): rabbit: average score: 1.45, conjunctive rubor: 3 (EU-RAR No.18,2002)
**PRODUCT NAME**: Reference electrode solution for Diamond electrode

**SDS No.6001-0003**

### SENSITIZATION

No data available

### GERM CELL MUTAGENICITY

This product is classified in Category 2 by Acetonitrile.

### CARCINOGENICITY

No data available

### REPRODUCTIVE TOXICITY

No data available

### SPECIFIC TARGET ORGAN TOXICITY - single exposure -

- **MeCN**: Effect to Human (CERI hazard data96-17(1997), Environmental Risk Assessment No.2, Japan(2003))

### SPECIFIC TARGET ORGAN TOXICITY - repeated exposure -

- **MeCN**: Animal examination, positive (EU-RAR No.18(2002), Environmental Risk Assessment No.2, Japan(2003))

### ASPIRATION HAZARD

No data available

### 12. ECOLOGICAL INFORMATION

**Hazardous to the aquatic environment - Acute hazard -**

- **AgNO3**: Daphnia magna; EC50=0.0009 mg/L, 48h(corresponding value)(CICADs 44,2002)

**Hazardous to the aquatic environment - Chronic hazard -**

- **AgNO3**: Rainbow fish; LOEC=0.00016 mg/L,60D (CICADs 44,2002)

**MOBILITY IN SOIL**

No data available

**BIODEGRADABILITY**

- **MeCN**: 1.00 x 106 mg/L(PHYSPROP Database,2005)

**BIOACCUMULATIVE POTENTIAL**

- **AgNO3**: BCF=600 (Existing Chemical Substances Safety Evaluation Data)

### 13. DISPOSAL INFORMATION

Dispose in a hazardous-waste site in accordance with all applicable regulations. Any disposal practice must be in compliance with country, local, state, and federal laws and regulations (contact country, local or state environment agency for specific rules).

### 14. TRANSPORT INFORMATION

- **IATA UN NUMBER**: 1992
- **UN PROPER SHIPPING NAME**: FLAMMABLE LIQUID, TOXIC, N.O.S (Acetonitrile solution)
- **CLASS**: 3, flammable liquid (6.1, toxic substances)
- **PACKING GROUP**: II
- **ADR/RID**: 1992, FLAMMABLE LIQUID, TOXIC, N.O.S, Class 3, PG II
- **DOT**: 1992, FLAMMABLE LIQUID, TOXIC, N.O.S, Class 3, PG II
- **MARINE POLLUTANT**: No

### 15. REGULATORY INFORMATION

**US REGULATIONS**: Labeling according to EC Directives; See section 2

**EU REGULATIONS**: Labeling according to EC Directives; See section 2

### 16. OTHER INFORMATION

**NOTICE:**

The information contained in the SDS description is applicable exclusively to the chemical substance identified herein and for its intended use as an analytical reference standard or reagent and to the unit quantity intended for that purpose. The information does not relate to, and may not be appropriate for, any application or larger quantity of the substance described. Our products are intended for the use by individuals possessing sufficient technical skill and qualification on use the material potential hazardous chemical. Accordingly, no representation or warranty, express or implied, with respect to merchantability and fitness for a particular purpose is made with respect to the information contained herein.

**Attention:**

This product in terms of chemical identity and the unit amount provide is intended for use in chemical analysis and not for human consumption, nor any other purpose.