1. Identification

Product name: AQUAMICRON AKX
Manufacturer: Mitsubishi Chemical Corporation
Address: 1-1 Marunouchi 1-chome, Chiyoda-ku, Tokyo 100-8251, Japan
Division: Fine Chemicals Department
Person in charge: Fine Chemicals Department
Phone number: +81-3-6748-7246
FAX number: +81-3-3286-1226
Emergency phone number: +81-3-6748-7246
Reference number: C8-AKX-00002-01-03-01-01
Recommended use of the chemical and restrictions on use:
- Reagent for Karl Fischer moisture measurement. Laboratory use only.

2. Hazards identification

GHS classification:
- Physical hazards:
  - Explosives: Classification excluded
  - Flammable gases (including chemically unstable gases): Classification excluded
  - Aerosols: Classification excluded
  - Oxidizing gases: Classification excluded
  - Gases under pressure: Classification excluded
  - Flammable liquids: Not classified
  - Flammable solids: Classification excluded
  - Self-reactive substances and mixtures: Classification excluded
  - Pyrophoric liquids: Not classified
  - Pyrophoric solids: Classification excluded
  - Self-heating substances and mixtures: Classification not possible
  - Substances and mixtures which, in contact with water, emit flammable gases: Classification excluded
  - Oxidizing liquids: Classification not possible
  - Oxidizing solids: Classification excluded
  - Organic peroxides: Classification excluded
  - Corrosive to metals: Classification not possible

- Health hazards:
  - Acute toxicity / Oral: Classification not possible
  - Acute toxicity / Dermal: Classification not possible
  - Acute toxicity / Inhalation (gas): Classification excluded
  - Acute toxicity / Inhalation (vapour): Classification not possible
  - Acute toxicity / Inhalation (dust/mists): Classification not possible
  - Skin corrosion / Irritation: Classification not possible
  - Serious eye damage / Eye irritation: Category 2A
  - Respiratory sensitization: Classification not possible
  - Skin sensitization: Category 1
  - Germ cell mutagenicity: Classification not possible
  - Carcinogenicity: Classification not possible
  - Reproductive toxicity: Category 2
  - Specific target organ toxicity (single exposure): Category 2 (respiratory organ), Category 3 (anesthesia)
  - Specific target organ toxicity (repeated exposure): Category 2 (thyroid gland, respiratory organ)
Aspiration hazard: Classification not possible

Environmental hazards:
- Hazardous to the aquatic environment (acute): Category 2
- Hazardous to the aquatic environment (long-term): Classification not possible
- Hazardous to the ozone layer: Classification not possible

GHS label elements:
- Symbol:
- Signal words:
- Hazard statements:
  - H336: May cause drowsiness or dizziness.
  - H319: Causes serious eye irritation.
  - H317: May cause an allergic skin reaction.
  - H361: Suspected of damaging fertility or the unborn child.
  - H371: May cause damage to organs (respiratory organ).
  - H373: May cause damage to organs (thyroid gland, respiratory organ) through prolonged or repeated exposure.
  - H401: Toxic to aquatic life.

Precautionary statement:
- Prevention:
  - P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
  - P271: Use only outdoors or in a well-ventilated area.
  - P264-1: Wash hands thoroughly after handling.
  - P280: Wear protective gloves/protective clothing/eye protection/face protection.
  - P264-1: Contaminated work clothing should not be allowed out of the workplace.
  - P201: Obtain special instructions before use.
  - P202: Do not handle until all safety precautions have been read and understood.
  - P260: Do not breathe dust/fume/gas/mist/vapours/spray.
  - P270: Do not eat, drink or smoke when using this product.
  - P273: Avoid release to the environment.

Response:
- P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P312: Call a POISON CENTER/doctor if you feel unwell.
- 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 advice/attention.
- P302+P352: IF ON SKIN: Wash with plenty of water and soap.
- P321-1: Specific treatment (see on this label).
- P333+P313: If skin irritation or rash occurs: Get medical advice/attention.
- P362+P364: Take off contaminated clothing and wash it before reuse.
- P308+P313: If exposed or concerned: Get medical advice/attention.
- P308+P311: If exposed or concerned: Call a POISON CENTER/doctor.
- P314: Get medical advice/attention if you feel unwell.

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

Disposal:
- P501-1: Dispose of contents/container in accordance with local/regional/national/international regulations.

3. Composition / information on ingredients

Distinction of substance or mixture: mixture

Chemical name or generic name: No information

Components:

<table>
<thead>
<tr>
<th>No.</th>
<th>Components name</th>
<th>CAS No.</th>
<th>Molecular formula</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Propylene carbonate</td>
<td>108-32-7</td>
<td>C4H6O3</td>
<td>40-50%</td>
</tr>
<tr>
<td>2</td>
<td>Diethylene glycol monoethyl ether</td>
<td>111-90-0</td>
<td>C6H14O3</td>
<td>30-40%</td>
</tr>
<tr>
<td>3</td>
<td>1,3-Di(4-pyridyl)propane</td>
<td>17252-51-6</td>
<td>C13H14N2</td>
<td>5-10%</td>
</tr>
<tr>
<td>4</td>
<td>4-Dimethylaminopyridine</td>
<td>1122-58-3</td>
<td>C7H10N2</td>
<td>5-10%</td>
</tr>
<tr>
<td>No.</td>
<td>The Chemical Substance Control Law Class Reference Number in the Gazette List</td>
<td>The Gazette List</td>
<td>Industrial Safety and Health Law Class Reference Number in the Gazette List</td>
<td>Industrial Safety and Health Law</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>(5)-524,(7)-737</td>
<td>Published chemical substances</td>
<td>No information</td>
<td>No information</td>
</tr>
<tr>
<td>2</td>
<td>(2)-422,(7)-97</td>
<td>Published chemical substances</td>
<td>No information</td>
<td>No information</td>
</tr>
<tr>
<td>3</td>
<td>No information</td>
<td>8-(1)-1741</td>
<td>No information</td>
<td>No information</td>
</tr>
<tr>
<td>4</td>
<td>(5)-5479</td>
<td>8-(1)-586</td>
<td>No information</td>
<td>No information</td>
</tr>
<tr>
<td>5</td>
<td>No information</td>
<td>Notifiable Substances</td>
<td>606</td>
<td>No information</td>
</tr>
<tr>
<td>6</td>
<td>(1)-536</td>
<td>Published chemical substances</td>
<td>414</td>
<td>No information</td>
</tr>
</tbody>
</table>

### 4. First-aid measures

**If inhaled:**
- P340: Remove person to fresh air and keep comfortable for breathing.
- P312: Call a POISON CENTER/doctor if you feel unwell.

**If on skin:**
- P352-1: Wash with plenty of water and soap.
- P321-2: Specific treatment (see on this label).
- P333+P313: If skin irritation or rash occurs: Get medical advice/attention.
- P362+P364: Take off contaminated clothing and wash it before reuse.

**If in eyes:**
- 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 advice/attention.

**If swallowed:**
- Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER/doctor.

### 5. Fire-fighting measures

**Extinguishing media:**
- Alcohol-resistant foam, carbon dioxide, dry sand, expanded vermiculite or perlite.

**Unsuitable extinguishing media:**
- Water (stick water, high-pressurized water).

### 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures:**
- Eliminate neighboring ignition sources, hot surfaces and flammables immediately.
- Wear appropriate protective equipment (see Section 8. Exposure controls/personal protection) during working. Avoid contact with eyes/skin and inhalation of the gas.

**Environmental precautions:**
- Avoid discharge of the spilled products into rivers and influence on the environment.

**Methods and materials for containment and cleaning up:**
- Use only non-sparking tools.
- Absorb the material in soil, sand or other non-combustible material. In case of large spill, avoid overflow by enclosing the affected area with an embankment.
- Scoop into suitable airtight containers. Appropriate treat as industrial waste according to the local government’s disposal regulations.

### 7. Handling and storage

#### Handling

**Technical measures:**
- Handle in a location with closed equipment, local exhaust, or general ventilation. Ventilate the workplace adequately. Do not breathe divergent vapors or dust.

**Precautions for safe handling:**
- Prohibit the use of ambient high temperature objects, sparks and fire. Do not eat, drink or smoke when using this product. Do not inhale or swallow. Do not breathe dust. After handling Wash hands thoroughly.
- Take precautionary measures against static discharge.

**Avoiding incompatibilities:**
- No information

#### Storage

**Conditions for safe storage:**
- Protect from direct sunlight. Store at well ventilated place. Store at room temperature.

**Container and packaging material for safe storage:**
- Use airtight containers.

### 8. Exposure controls/personal protection

**Occupational exposure limits:**
- Japan Society for Occupational Health
  - **Components:** Iodine
Components: Iodine
  0.01ppm (Inhalable Fraction and Vapor) (2018) [TWA]
  0.1ppm (vapor fraction) (2018) [STEL]

Components: Sulfur Dioxide
  0.25ppm (2017) [STEL]

※TWA (Time Weighted Average)
Average exposure to a contaminant to which workers may be exposed without adverse effect over a period such as in an 8-hour day or 40-hour week (an average work shift).

※STEL (Short Term Exposure Limit)
The acceptable exposure limit to a toxic or an irritant substance over a short period of time (time-weighted average), usually 15 minutes.
STEL is the maximum concentration of a chemical to which workers may be exposed continuously for a short period of time without any danger to health, safety or work efficiency.
Workers can be exposed to a maximum of four STEL periods per 8 hour shift, with at least 60 minutes between exposure periods.

Engineering measures:
• Prevent workers from direct contact or exposure.
• Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
• Use air ventilating system to avoid accumulation of steam.

Personal protective equipment:
Respiratory protection: • Wear an appropriate protective mask for respiration.
Hand protection: • Wear protective gloves.
Eye protection: • Wear eye protection.
Skin and body protection: • Wear protective clothing.

9. Physical and chemical properties
Appearance (physical state, form, color etc.)
Physical state: Liquid
Color: Yellow ~ Reddish brown transparent liquid
Odour: Irritating odor
pH: No information
Melting point / Freezing point: No information

Boiling point, initial boiling point, and boiling range:
Product: No data
Components: Propylene carbonate 242 °C[1]
Components: Diethylene glycol monoethyl ether 196 °C 101300 Pa [2]
Components: 4-Dimethylaminopyridine 162 °C
Components: Iodine 184 °C[3]

Flash point: 105 °C Cleveland Open Cup
Upper flammability or explosive limits:
Product: No data
Components: Propylene carbonate 1.8 vol%[4]
Components: Diethylene glycol monoethyl ether 1.2 vol%[5]

Lower flammability or explosive limits:
Product: No data
Components: Propylene carbonate 14.3 vol%[4]
Components: Diethylene glycol monoethyl ether 23.5 vol%[5]

Vapour pressure:
Product: No data
Components: Propylene carbonate 0.045 mmHg 25 °C [6]
Components: Diethylene glycol monoethyl ether 25.262 Pa 20 °C [7]
Components: Iodine 100 Pa 20 °C [7]

Specific gravity: 1.141 20 °C
Solubility
Solubility for water: Readily soluble
Solubility for solvents: No information
Partition coefficient: n-octanol/water: No information
Auto-ignition temperature:
Product: No data
Components: Propylene carbonate 435 °C[4]
Components: Diethylene glycol monoethyl ether 218 °C[8]
## 10. Stability and reactivity

<table>
<thead>
<tr>
<th>Component</th>
<th>Reactivity</th>
<th>Chemical stability</th>
<th>Possibility of hazardous reactions</th>
<th>Conditions to avoid</th>
<th>Incompatible materials</th>
<th>Hazardous decomposition products</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Dimethylaminopyridine</td>
<td>No information</td>
<td>Stable under the normal storage/handling condition.</td>
<td>Flammability. Contains oxidizing substance (iodine).</td>
<td>No information</td>
<td>No information</td>
<td>No information</td>
</tr>
</tbody>
</table>

## 11. Toxicological information

### Acute toxicity:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Route</th>
<th>Species</th>
<th>LD50 or LC50</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene carbonate</td>
<td>Oral</td>
<td>Rat</td>
<td>&gt;5000 mg/kg</td>
<td>[9]</td>
</tr>
<tr>
<td></td>
<td>Dermal</td>
<td>Rabbit</td>
<td>&gt;3000 mg/kg</td>
<td>[9]</td>
</tr>
<tr>
<td>Diethylene glycol monoethyl ether</td>
<td>Oral</td>
<td>Rat</td>
<td>5540 mg/kg</td>
<td>[5]</td>
</tr>
<tr>
<td></td>
<td>Dermal</td>
<td>Rabbit</td>
<td>8500 mg/kg</td>
<td>[8]</td>
</tr>
<tr>
<td>4-Dimethylaminopyridine</td>
<td>Oral</td>
<td>Rat</td>
<td>250 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Iodine</td>
<td>Oral</td>
<td>Rat</td>
<td>14000 mg/kg</td>
<td>[10]</td>
</tr>
<tr>
<td></td>
<td>Dermal</td>
<td>Rabbit</td>
<td>1450 mg/kg</td>
<td>[11]</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>Vapours</td>
<td>Rat</td>
<td>800 mg/m3(1H)</td>
<td>[10]</td>
</tr>
<tr>
<td></td>
<td>Dusts and Mists</td>
<td>Rat</td>
<td>&gt;4.588 mg/L(4H)</td>
<td>[11]</td>
</tr>
<tr>
<td></td>
<td>Gas</td>
<td>Rat</td>
<td>&gt;593 ppm &lt;1319 ppm(4H)</td>
<td>[12]</td>
</tr>
</tbody>
</table>

### Skin Corrosion / Irritation:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>2</td>
</tr>
<tr>
<td>Propylene carbonate</td>
<td>2A</td>
</tr>
<tr>
<td>Diethylene glycol monoethyl ether</td>
<td>2A</td>
</tr>
<tr>
<td>Iodine</td>
<td>2B</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>2A</td>
</tr>
</tbody>
</table>

### Respiratory or skin sensitization:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>1</td>
</tr>
</tbody>
</table>

### Reproductive toxicity:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>2</td>
</tr>
</tbody>
</table>

### Specific target organ toxicity:

#### (single exposure):

<table>
<thead>
<tr>
<th>Substance</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>2(2)</td>
</tr>
</tbody>
</table>

#### (repeated exposure):

<table>
<thead>
<tr>
<th>Substance</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>2(1)</td>
</tr>
</tbody>
</table>
12. Ecological information

**Ecotoxicity:**

<table>
<thead>
<tr>
<th>Product</th>
<th>Category</th>
<th>EC50 (48H)</th>
<th>Species/Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene carbonate</td>
<td></td>
<td>&gt;1000 mg/L</td>
<td>Crustacea</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Daphnia magna)</td>
</tr>
<tr>
<td>Diethylene glycol monoethyl ether</td>
<td></td>
<td>3340 mg/L</td>
<td>Crustacea (or shrimp, amphipoda, mysidacea)(Daphnia magna)</td>
</tr>
<tr>
<td>Iodine</td>
<td></td>
<td>0.16 mg/L</td>
<td>Fish(Oncorhynchus mykiss)</td>
</tr>
</tbody>
</table>

**Hazardous to the aquatic environment (acute):**

<table>
<thead>
<tr>
<th>Product</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>Category 2</td>
</tr>
</tbody>
</table>

**Persistence and degradability:**

- No information

**Bioaccumulation:**

- No information

**Mobility in soil:**

- No information

**Hazardous to the ozone layer:**

- No information

13. Disposal considerations

**Residual waste:**

- For incineration of waste paints, adsorb onto diatomaceous earth, etc. and then incinerate in an open incinerator little by little. Or spray into the firebox of an incinerator for incineration. Conclude an outsourcing contract with a licensed industrial waste disposers if such disposal might generate hazardous gases such as dioxins.
- Contract with a licensed industrial waste vendor for disposal based on the Disposal Standard of Specially Controlled Industrial Waste as this is specially controlled industrial waste (waste oil).
- Entrust to specialized industrial waste disposers who have received permission from prefectural governor, issue manifesto, and dispose.

**Contaminated container and packaging:**

- Entrust to licensed industrial waste disposers to dispose.
- Empty containers should be disposed of after the residues are completely removed.

14. Transport information

**Domestic regulations:**

- Comply with the laws and regulations set forth in "15. Regulatory information."
- During marine transportation, follow the provisions of "Ship Safety Act" and "Law Relating to the Prevention of Marine Pollution and Maritime Disaster."
- During air transportation, follow the provisions of "Civil Aeronautics Act."

**Land regulatory information:**

- Follow the provisions of "Fire Service Act."

15. Regulatory information

16. Other information

**References**

2. The Merck Index
3. WHO/ICPS: International Chemical Safety Cards (ICSC) (Japanese version)
4. EU European Chemicals Bureau (ECB): International Uniform Chemical Information Database (IUCLID) 2000
6. PHYSPROP Database
7. CRC: CRC Handbook of Chemistry and Physics, 84th
[8] EU European Chemicals Bureau (ECB): International Uniform Chemical Information Database (IUCLID)
[10] Patty’s Toxicology Vol.5th 2001
[11] EU REACH Registered substances information

Contact
Company name : Mitsubishi Chemical Corporation
Address : 1-1 Marunouchi 1-chome, Chiyoda-ku, Tokyo 100-8251, Japan
Division : Fine Chemicals Department
Person in charge : Fine Chemicals Department
Phone number : +81-3-6748-7246
FAX number : +81-3-3286-1226
Emergency phone number : +81-3-6748-7246

Other information
- This safety data sheet (SDS) is issued based on the latest reference, data etc currently available. The information in this SDS has been carefully assessed, but no guarantee is given for its accuracy. We cannot anticipate all conditions under which this product may be used. It is the user’s responsibility to take appropriate safety measures for handling.