IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product Name: Acetonitrile
CAS-No.: ALTFORM
Product Code: 1035140
Date of Preparation: 04/08/2010

HAZARD IDENTIFICATION

Emergency Overview
Caution
Flammable liquid and vapor. Overexposure may cause CNS depression. Irritating to eyes. Irritating to respiratory system and skin. Probable reproductive hazard.

Color: Colorless to light
Physical state: Liquid
Odor: Sweet Aromatic
Health: NFPA 704
Fire: 2
Instability: 3

Potential Health Effects
Principle routes of exposure: Eye contact. Skin contact. Inhalation.

Eye contact: Contact with eyes may cause irritation or burning.

Skin contact: May cause moderate to severe irritation, burning, and dryness of the skin.

Inhalation: Liver and kidney injuries may occur. Breathing of mists, vapors, or fumes may irritate the nose, throat and lungs. Symptoms may include headache, excitement, euphoria, dizziness, incoordination, difficulty breathing, drowsiness, light-headedness, blurred vision, fatigue, stomach pain, nausea or vomiting, tremors, convulsions, loss of consciousness, cyanosis, central nervous system depression, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Ingestion: May cause irritation of the mouth, throat and gastrointestinal tract. Inhalation of high vapor concentrations can cause CNS-depression and narcosis. Liver and kidney injuries may occur. May cause cardiac disturbances and/or muscle tremors and impaired motor function. Symptoms may be delayed.

Chronic toxicity: Prolonged or repeated exposure may cause liver or kidney damage. This product may cause teratogenic or mutagenic effects.

Other information on acute toxicity: Acetonitrile is metabolized in the liver to water, formic acid, and hydrogen cyanide. The cyanide is further metabolized to thiocyanate. The onset of symptoms is generally delayed pending conversion to cyanide.

COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS Number</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetonitrile</td>
<td>75-05-8</td>
<td>100</td>
</tr>
</tbody>
</table>

FIRST AID MEASURES

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Skin contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation develops.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a physician immediately.

Ingestion: Rinse mouth. Drink plenty of water. Never give anything by mouth to an unconscious person or convulsing. Do not induce vomiting without medical advice. Call a physician immediately.
Notes to physician: Treat symptomatically. Exposure should be treated as cyanide poisoning. Effects may be delayed. May be partially metabolized to cyanide in the body. Have a cyanide kit available. If ingested, irrigate the stomach. In the case of ingestion, the stomach should be emptied by gastric lavage under qualified medical supervision.

5. FIRE-FIGHTING MEASURES

Flash point (°C): 6 (43°F) Method: Cleveland closed cup

Autoignition temperature (°C): 524

Suitable extinguishing media: Use dry chemical, CO₂, water spray or "alcohol" foam.


Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

Unusual hazards: Risk of explosion if heated under confinement. Vapors are heavier than air and may spread along floors. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Flammable liquid. Evacuate area of all unnecessary personnel. Keep people away from and upwind of spill/leak. Remove all sources of ignition. Wear personal protective equipment.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Do not flush into surface water or sanitary sewer system.

Methods for cleaning up: Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. In the case of hazardous fumes, wear self-contained breathing apparatus. Dispose of promptly. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling: Handle in accordance with good industrial hygiene and safety practice. Do not breathe vapors or spray mist. Avoid contact with skin, eyes and clothing. Wash hands thoroughly before eating, drinking or smoking. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

Storage: Keep containers tightly closed in a dry, cool and well-ventilated place. Keep product and empty container away from heat and sources of ignition. This compound is hygroscopic.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>ACGIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetonitrile</td>
<td>40 ppm TWA</td>
<td>Skin - potential significant contribution to overall exposure by the cutaneous route</td>
</tr>
<tr>
<td></td>
<td>70 mg/m³ TWA</td>
<td>20 ppm TWA</td>
</tr>
</tbody>
</table>

Engineering measures: Use only in area provided with appropriate exhaust ventilation. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Eye protection: Tightly fitting safety goggles. If splashes are likely to occur, wear: Face-shield.

Skin and body protection: Wear chemically protective gloves, lab coat or apron to prevent prolonged or repeated skin contact. If conditions warrant, use butyl rubber apron and boots.

Hand protection: Chemical-resistant gloves and impermeable body covering to minimize skin contact. Use butyl or neoprene rubber gloves.

Respiratory protection: When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. In the case of hazardous fumes, wear self contained breathing apparatus.
### 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Colorless to light</td>
</tr>
<tr>
<td>Odor</td>
<td>Sweet Aromatic</td>
</tr>
<tr>
<td>Boiling point/range (°C)</td>
<td>81.85</td>
</tr>
<tr>
<td>Melting point/range (°C)</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor density (Air=1)</td>
<td>1.4</td>
</tr>
<tr>
<td>Evaporation Rate (Water = 1)</td>
<td>No data available</td>
</tr>
<tr>
<td>VOC content (%)</td>
<td>No data available</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>41.05</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific gravity (Water =1)</td>
<td>0.79</td>
</tr>
<tr>
<td>Vapor pressure (mmHg)</td>
<td>No data available</td>
</tr>
<tr>
<td>Water solubility (mg/l)</td>
<td>Miscible</td>
</tr>
</tbody>
</table>

### 10. Stability and Reactivity

- **Stability**: Stable under recommended storage conditions.
- **Polymerization**: Will not occur.
- **Hazardous decomposition products**: Carbon oxides. Hydrogen cyanide (hydrocyanic acid).
- **Materials to avoid**: Oxidizing agents.
- **Conditions to avoid**: Heat, flames and sparks.

### 11. Toxicological Information

- **Acute toxicity**
  - LD50/oral/rat = 1327 mg/kg
  - LD50/dermal/rabbit = 395 mg/kg
  - LC50/inhalation/4h/rat = 16000 ppm/4H

- **Carcinogenic Effects**: Not listed by IARC, NTP or OSHA as a carcinogen.
- **Target Organ Effects**: Liver, Kidney. Central nervous system. Respiratory system.
- **Other information on acute toxicity**
  - Acetone is metabolized in the liver to water, formic acid, and hydrogen cyanide. The cyanide is further metabolized to thiocyanate. The onset of symptoms is generally delayed pending conversion to cyanide.

- **Component Information**

  - **Acetone**: NIOSH - LD50s and LC50s:
    - Oral LD50 Rat: 2460 mg/kg
    - Dermal LD50 Rabbit: >2000 mg/kg
    - Inhalation LC50 Rat: 7551 ppm/8H

### 12. Ecological Information

- **Aquatic toxicity**: Acetone: = 1640 mg/L LC50 fathead minnow 96 h flow-through. 96 Hr LC50 Pimephales promelas:1640 mg/L (flow-through); 96 Hr LC50 Pimephales promelas:1000 mg/L (static); 96 Hr LC50 Lepomis macrochirus: 1850 mg/L (static); 96 Hr LC50 Poecilia reticulata: 1650 mg/L (static). 15 Hr EC50 Aerobic microorganisms: 7500 mg/L; 48 Hr EC50 Anaerobic bacteria: 28000 mg/L; 24 Hr EC50 Nitrosomonas: 73 mg/L; 18 Hr EC50 Daphnia pulex: 5838 mg/L.

- **Persistence and degradability**: Acetone: BOD: 17%, 5 days.

### 13. Disposal Considerations

- **Waste from residues / unused products**: Dispose of according to all federal, state and local applicable regulations. Where possible recycling is preferred to disposal or incineration.

- **US EPA Waste Number**: U003
14. TRANSPORT INFORMATION

DOT (U.S.)
UN/ID No: UN1648
Proper shipping name: Acetonitrile
U.S. DOT - Hazard Class: 3
Packing group: II

TDG (Canada)
Proper shipping name: Acetonitrile
Hazard class: 3
Packing group: II

15. REGULATORY INFORMATION

U.S. Regulations:

<table>
<thead>
<tr>
<th>Components</th>
<th>SARA 313:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetonitrile</td>
<td>1.0 % de minimis concentration</td>
</tr>
</tbody>
</table>

State Regulations
This product or its ingredients have been evaluated for New Jersey, Pennsylvania, and California Prop 65 supplier notification requirements. Substances that are subject to notification requirements, if any, are listed below.

<table>
<thead>
<tr>
<th>Components</th>
<th>State Regulations - NJ; PA; CA Prop 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetonitrile</td>
<td>Listed (NJRTK)</td>
</tr>
<tr>
<td></td>
<td>Listed (PARTK)</td>
</tr>
</tbody>
</table>

Canadian WHMIS
WHMIS hazard class: B2  Flammable liquid, D1A  Very toxic materials, D2B  Toxic materials.

Canadian Ingredient Disclosure List (IDL):

International Inventories
TSCA 9(b): Listed or exempt.
Canadian DSL: Listed or exempt.
EC-No. Listed or exempt.
Philippines (PICCS): Listed.
Japan (ENCS): Listed or exempt.
Korea (KECL): Listed.
China (IECS): Listed.
Australia (AICS): Listed.

16. OTHER INFORMATION

For Industrial Use Only

HMIS
Health: 2
Fire: 3
Physical hazard: 0
PPE: H

The information and recommendations contained in this Material Safety Data Sheet have been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

End of Safety Data Sheet

Product name: Acetonitrile

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