Section 1 - Product and Company Information

Product Name: ACETONITRILE
Product Number: 271004
Brand: Aldrich Chemical
Company: Sigma-Aldrich
Address: 3050 Spruce Street
City, State, Zip, Country: SAIN'T LOUIS, MO 63103 US
Technical Phone: 800-335-8832
Fax: 636-325-5002
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS #</th>
<th>SARA 313</th>
<th>EC no</th>
<th>Annex I Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACETONITRILE</td>
<td>75-05-8</td>
<td>Yes</td>
<td>200-935-2</td>
<td>608-501-003</td>
</tr>
</tbody>
</table>

Formula: C2H3N
Synonyms: Acetonitrile (German, Dutch), Acetamid (ACOGH-OHSA), Cyanamide, Cyanuric de methyl (French), Ethylacetate, Ethyl nitrite, Methacrylonitrile, Methane, cyan-, Methylacrylamid (Czech)

Section 3 - Hazards Identification

Emergency Overview
Flammable (USA) Highly Flammable (EU), Harmful. Harmful by inhalation, in contact with skin and if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes. This material can produce a cyanide-like effect. Target organs: Central nervous system, Liver.

HMIS Rating
Health: 2*  Flammability: 3  Reactivity: 0

NFPA Rating
Health: 2  Flammability: 3  Reactivity: 0
*additional chronic hazards present.

Section 4 - First Aid Measures

Oral Exposure
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Inhalation Exposure
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Dermal Exposure
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

Section 5 - Fire Fighting Measures

Flammable Hazards: Yes

Explosion Hazards
Vapor may travel considerable distance to source of ignition and flash back. Container explosion can occur under fire conditions. In advanced or massive fires the area should be evacuated and the fire should be fought from a remote explosion-resistant location.

Flash Point: 42 °F  6 °C

Explosion Limits: Lower: 4.4 %  Upper: 16 %

Autoignition Temp: 274 °C

Extinguishing Media
Suitable: For small (inception) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Firefighting
- Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
- Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.
- Specific Method(s) or Fire Fighting: For small (inception) fire extinguishing, use a portable fire extinguisher rated for flammable liquid fires. For large fires, fixed fire suppression systems, such as a sprinkler system, should be capable of extinguishing a flammable liquid fire.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill
Evacuate area. Shut off all sources of ignition.

Procedure(s) of Personal Precaution(s)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up
Cover with dry lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling
User Exposure
Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.
Section 8 - Exposure Controls / PPE

Engineering Controls
Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

Personal Protective Equipment
Respiratory
Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Hand
Compatible chemical-resistant gloves.

Eye
Chemical safety goggles.

General Hygiene Measures
Wash thoroughly after handling. Wash contaminated clothing before reuse.

Exposure Limits, RTECS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>ACGIH</td>
<td>STEL</td>
<td>60 PPM</td>
</tr>
<tr>
<td>USA</td>
<td>ACGIH</td>
<td>TWA</td>
<td>40 PPM</td>
</tr>
<tr>
<td>USA</td>
<td>MSHA Standard air</td>
<td>TWA</td>
<td>40 PPM (70 MG/M3)</td>
</tr>
<tr>
<td>USA</td>
<td>OSHA</td>
<td>PEL</td>
<td>8H TWA 40 PPM (70 MG/M3)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>OEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>NIOSH</td>
<td>TWA</td>
<td>20 PPM</td>
</tr>
</tbody>
</table>

Section 9 - Physical/Chemical Properties

Appearance
Physical State
Liquid
Color
Colorless
Form
Clear liquid
Odor
Pungent

Molecular Weight: 41.05 AMU

Property
Value

At Temperature or Pressure

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>N/A</td>
</tr>
<tr>
<td>Boiling Point Range</td>
<td>81- 82 °C</td>
</tr>
<tr>
<td>Flash Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>72.8 mmHg</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Saturated Vapor Conc.</td>
<td>N/A</td>
</tr>
<tr>
<td>Sg/Density</td>
<td>0.796 g/cm3</td>
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<tr>
<td>Vapor Density</td>
<td>1.41 g/l</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>70 - 675 ppm</td>
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<tr>
<td>Volatility</td>
<td>N/A</td>
</tr>
<tr>
<td>VOC Content</td>
<td>N/A</td>
</tr>
<tr>
<td>Water Content</td>
<td>&lt; 0.05 %</td>
</tr>
<tr>
<td>Solvent Content</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Section 10 - Stability and Reactivity

Stability
Stable

Materials to Avoid
Acids, Bases, Oxidizing agents, Reducing agents, Alkalai metals.

Hazardous Decomposition Products
Carbon monoxide, Carbon dioxide, Nitrogen oxides, Hydrogen cyanide.

Hazardous Polymerization
Will not occur.

Section 11 - Toxicological Information

Route of Exposure
Skin Contact
May cause skin irritation.

Skin Absorption
May cause skin absorption.

Eye Contact
Causes severe eye irritation.

Inhalation
Harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.

Ingestion
Harmful if swallowed.

Target Organ(s) or System(s)

Signs and Symptoms of Exposure
This material can produce a cyanide-like effect. Always have a cyanide first-aid kit present when using this material. The onset of symptoms is generally delayed pending conversion to cyanide. Adverse effects may include nausea, vomiting, diarrhoea, dizziness, rash and cyanosis. Other symptoms include mental excitement or depression, drowsiness, impaired perception, incoordination, stupor, coma, and death.

Conditions Aggravated by Exposure
Acetone is metabolized in the liver to water, formic acid, and hydrogen cyanide. The cyanide is further metabolized to thiocyanate.

RTECS Number: AL7700000

Aldrich Chemical, Sigma-Aldrich Corporation
Page 3
www.sigma-aldrich.com
**Toxicity Data**

- **Oral - Rat**: 2400 mg/kg (LD50)
  - Inhalation - Rat: 7551 ppm (LC50)
- **Intraperitoneal - Rat**: 850 mg/kg (LD50)
- **Subcutaneous - Rat**: 3500 mg/kg (LD50)
- **Intravenous - Rat**: 1980 mg/kg (LD50)
- **Parenteral - Rat**: 1100 mg/kg (LD50)
- **Oral - Mouse**: 260 mg/kg (LD50)
  - Inhalation - Mouse: 2690 ppm (LC50)
- **Intraperitoneal - Mouse**: 175 mg/kg (LD50)
  - Lungs: Thorax, or Respiration: Dyspnea.
- **Subcutaneous - Mouse**: 4480 mg/kg (LD50)
  - Intravenous - Mouse: 612 mg/kg (LD50)
- **Oral - Cat**: 200 mg/kg (LD50)
  - Inhalation - Cat: 18,000 mg/m3 (LC50)
- **Oral - Rabbit**: 50 mg/kg (LD50)
  - Inhalation - Rabbit: 2696 ppm (LC50)
- **Skin - Rabbit**: 1250 UL/KG (LD50)
- **Oral - Guinea pig**: 177 mg/kg (LD50)
  - Inhalation - Guinea pig: 5.655 ppm (LC50)
- **Oral - Hamster**: 1670 mg/kg (LD50)

**Irritation Data**

- **Skin - Rabbit**: 500 mg
  - Remarks: Mild irritation effect
- **Eyes - Rabbit**: 20 mg
  - Remarks: Severe irritation effect
- **Skin - Rabbit**: 500 mg
  - Remarks: Open irritation test

**Chronic Exposure - Carcinogen**

- Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

- **Rat - Inhalation**: 400 PPM 6H/24Y
  - Result: Tumorigenic: equivocal tumorogenic agent by RTECS criteria. Liver Tumors.

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**NTP Carcinogen List**

- **Rating**
  - Equivocal evidence.
  - No evidence.
- **Species**
  - Rat
  - Mouse
- **Route**
  - Inhalation

**ACGIH Carcinogen List**

- **Rating**
  - A4

**Chronic Exposure - Teratogen**

- **Species**: Rat
  - **Route of Application**: Oral
  - **Exposure Time**: 80 PREG
  - Result: Specific Developmental Abnormalities: Musculoskeletal system.

- **Species**: Hamster
  - **Route of Application**: Oral
  - **Exposure Time**: 80 PREG
  - Result: Effects on Embryo or Fetuses: Fetal death (e.g., stunted fetus).

**Chronic Exposure - Mutagen**

- **Species**: Rat
  - **Route of Application**: Oral
  - **Exposure Time**: 80 PREG
  - Result: Effects on Embryo or Fetuses: Fetal death.

**Chronic Exposure - Reproductive Hazard**

- **Species**: Rat
  - **Route of Application**: Oral
  - **Exposure Time**: 80 PREG
  - Result: Effects on Reproductive Hazard: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

**Section 12 - Ecological Information**

**Acute Ecotoxicity Tests**

- **Test Type**: LC50 Fish
- **Species**: Pimephales promelas (Fathead minnow)
  - **Time**: 96.0 h
  - **Value**: 1.646 mg/l

**Section 13 - Disposal Considerations**

- **Appropriate Method of Disposal of Substance or Preparation**: Contact a licensed professional waste disposal service to dispose of this material.
- **Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.**
- **Observe all federal, state, and local environmental regulations.**

**Section 14 - Transport Information**

- **DOT**: Proper Shipping Name: Acetone
Section 15 - Regulatory Information

EU Directives Classification
Symbol of Danger: F Xn
Indication of Danger
Highly Flammable. Harmful.
Risk Statements
R: 11 20/21/22 36
Highly flammable. Harmful by inhalation, in contact with skin and if swallowed. Irritating to eyes.
Safety Statements
S: 16 36/37
Keep away from sources of ignition - no smoking. Wear suitable protective clothing and gloves.

US Classification and Label Text
Indication of Danger
Flammable (USA) Highly Flammable (EU). Harmful.
Risk Statements
Harmful by Inhalation, in contact with skin and if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes.
Safety Statements
Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accidental or if you feel unwell, seek medical advice immediately (show the label where possible).
US Statements
This material can produce a cyanide-like effect. Target organ(s): Central nervous system. Liver.

United States Regulatory Information
SARA Listed: Yes
Deminimis: 1 %
Notes: This product is subject to SARA section 313 reporting requirements.

TSCA inventory item: Yes

Canada Regulatory Information
WHMIS Classification
This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

Disclaimer
For R&D use only. Not for drug, household or other uses.

Warranty
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc. shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.