SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Pyridine

Product Number : 270970
Brand : Sigma-Aldrich
Index-No. : 613-002-00-7
CAS-No. : 110-86-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO  63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

- Flammable liquids (Category 2), H225
- Acute toxicity, Oral (Category 4), H302
- Acute toxicity, Inhalation (Category 4), H332
- Acute toxicity, Dermal (Category 4), H312
- Skin irritation (Category 2), H315
- Eye irritation (Category 2A), H319
- Carcinogenicity (Category 2), H351
- Short-term (acute) aquatic hazard (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements
Pictogram

Signal word    Danger

Hazard statement(s)
H225          Highly flammable liquid and vapour.
H302 + H312 + H332  Harmful if swallowed, in contact with skin or if inhaled.
H315          Causes skin irritation.
H319          Causes serious eye irritation.
H351          Suspected of causing cancer.
H402          Harmful to aquatic life.

Precautionary statement(s)
P201          Obtain special instructions before use.
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.
P261          Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264          Wash skin thoroughly after handling.
P270          Do not eat, drink or smoke when using this product.
P271          Use only outdoors or in a well-ventilated area.
P273          Avoid release to the environment.
P280          Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330  IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P303 + P361 + P353  IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312  IF INHALED: Remove person to fresh air and keep comfortable for breathing. 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.
P308 + P313          IF exposed or concerned: Get medical advice/ attention.
P332 + P313          If skin irritation occurs: Get medical advice/ attention.
P337 + P313          If eye irritation persists: Get medical advice/ attention.
P362          Take off contaminated clothing and wash before reuse.
P370 + P378          In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P235          Store in a well-ventilated place. Keep cool.
P405          Store locked up.
P501          Dispose of contents/ container to an approved waste disposal plant.

2.3  Hazards not otherwise classified (HNOC) or not covered by GHS - none
SECTION 3: Composition/information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridine</td>
<td>Flam. Liq. 2; Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A; Carc. 2; Aquatic Acute 3; H225, H302, H332, H312, H315, H319, H351, H402</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

4.3 Indication of any immediate medical attention and special treatment needed
No data available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Dry powder Dry sand
**Unsuitable extinguishing media**
Do NOT use water jet.

**5.2 Special hazards arising from the substance or mixture**
Carbon oxides, Nitrogen oxides (NOx)

**5.3 Advice for firefighters**
Wear self-contained breathing apparatus for firefighting if necessary.

**5.4 Further information**
Use water spray to cool unopened containers.

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**SECTION 6: Accidental release measures**

**6.1 Personal precautions, protective equipment and emergency procedures**
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

**6.2 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.

**6.3 Methods and materials for containment and cleaning up**
Large spills should be collected mechanically (remove by pumping) for disposal. Ventilate the area. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

**6.4 Reference to other sections**
For disposal see section 13.

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**SECTION 7: Handling and storage**

**7.1 Precautions for safe handling**
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment. Keep away from sources of ignition - No smoking.
Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

**7.2 Conditions for safe storage, including any incompatibilities**
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Handle and store under inert gas.
Storage class (TRGS 510): 3: Flammable liquids

**7.3 Specific end use(s)**
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.
SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridine</td>
<td>110-86-1</td>
<td>TWA</td>
<td>1 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td></td>
<td></td>
<td>Liver damage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Kidney damage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Skin irritation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confirmed animal carcinogen with unknown relevance to humans</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TWA</th>
<th>5 ppm</th>
<th>15 mg/m³</th>
<th>USA. NIOSH Recommended Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA</td>
<td>5 ppm</td>
<td>15 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
</tbody>
</table>

The value in mg/m³ is approximate.

| PEL       | 5 ppm  | 15 mg/m³ | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 219 min
Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.
Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
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. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>a) Appearance</th>
<th>Form: liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odour</td>
<td>pungent</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>ca.8.81 at 20 °C (68 °F)</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>Melting point/range: -42 °C (-44 °F) - lit.</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>115 °C 239 °F - lit.</td>
</tr>
<tr>
<td>Flash point</td>
<td>20 °C (68 °F) - closed cup - ISO 1523</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>12.7</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Upper explosion limit: 12.4 %(V) Lower explosion limit: 1.8 %(V)</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>ca.26.7 hPa at 25 °C (77 °F)</td>
</tr>
<tr>
<td>Vapour density</td>
<td>2.73</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.978 g/cm3 at 25 °C (77 °F)</td>
</tr>
<tr>
<td>Water solubility</td>
<td>ca.1,000 g/l at 20 °C (68 °F)soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>log Pow: ca.0.64 at 20 °C (68 °F) - (Lit.), Bioaccumulation is not expected.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>900 °C (1652 °F) at 1,013 hPa</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>ca.490 °C (ca.914 °F) -</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
</tbody>
</table>
9.2 Other safety information

Solubility in other solvents
- Diethyl ether at 20 °C (68 °F) - miscible
- Ethanol at 20 °C (68 °F) - miscible

Surface tension
- 36.56 mN/m at 25 °C (77 °F)

Dissociation constant
- 5.25 at 25 °C (77 °F)

Relative vapour density
- 2.73

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air. Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
- Strong oxidizing agents
- Strong acids

10.6 Hazardous decomposition products
- Hazardous decomposition products formed under fire conditions. - Carbon oxides, Nitrogen oxides (NOx)
- Other decomposition products - No data available
- In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
- LD50 Oral - Rat - 1,500 mg/kg
- Remarks: (ECHA)
- LC50 Inhalation - Rat - male - 4 h - 17.1 mg/l (US-EPA)
- LD50 Dermal - Rabbit - > 1,000 - 2,000 mg/kg (OECD Test Guideline 402)
- No data available

Skin corrosion/irritation
- Skin - Rabbit
- Result: Mild skin irritation - 24 h
The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada

(Draize Test)

**Serious eye damage/eye irritation**
Eyes - Rabbit
Result: Irritating to eyes. - 24 h
Remarks: (ECHA)

**Respiratory or skin sensitisation**
Local lymph node assay (LLNA) - Mouse
Result: negative
(OECD Test Guideline 429)

**Germ cell mutagenicity**
Ames test
Salmonella typhimurium
Result: negative
In vitro mammalian cell gene mutation test
Chinese hamster lung cells
Result: negative
OECD Test Guideline 475
Mouse - male - Bone marrow
Result: negative

**Carcinogenicity**
IARC: 2B - Group 2B: Possibly carcinogenic to humans (Pyridine)
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

**Reproductive toxicity**
No data available

**Specific target organ toxicity - single exposure**
Acute oral toxicity - Vomiting, Nausea
Acute inhalation toxicity - mucosal irritations, Cough, Shortness of breath

**Specific target organ toxicity - repeated exposure**

**Aspiration hazard**

**Additional Information**
Repeated dose toxicity - Rat - male and female - Oral - 102 Weeks - No observed adverse effect level - 7 mg/kg
RTECS: UR8400000

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Dizziness, tachycardia, nervousness, insomnia, Skin disorders, loss of appetite
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Systemic effects:
After uptake:
Headache
In high doses:
narcosis, cardiovascular disorders, Circulatory collapse
Chronic uptake results in damage of:
Liver, Kidney
Good warning effect due to low odour threshold.
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: Ecological information

12.1 Toxicity

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>semi-static test EC50 - Danio rerio (zebra fish) - 560 - 1,000 mg/l - 96 h (OECD Test Guideline 203)</th>
<th>Remarks: (in analogy to similar products)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>EC50 - Daphnia magna (Water flea) - 320 mg/l - 48 h (OECD Test Guideline 202)</td>
<td>Remarks: (in analogy to similar products)</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>static test EC50 - Pseudokirchneriella subcapitata - 320 mg/l - 72 h (OECD Test Guideline 201)</td>
<td>Remarks: (in analogy to similar products)</td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability

| Biodegradability | aerobic - Exposure time 28 d Result: 97 % - Readily biodegradable. (OECD Test Guideline 301B) |

12.3 Bioaccumulative potential

12.4 Mobility in soil

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging**

Dispose of as unused product.
SECTION 14: Transport information

**DOT (US)**
- UN number: 1282
- Class: 3
- Proper shipping name: Pyridine
- Reportable Quantity (RQ): 1000 lbs
- Reportable Quantity (RQ): 1000 lbs
- Reportable Quantity (RQ): 100 lbs
- Poison Inhalation Hazard: No

**IMDG**
- UN number: 1282
- Class: 3
- Proper shipping name: PYRIDINE
- Packing group: II
- EMS-No: F-E, S-D

**IATA**
- UN number: 1282
- Class: 3
- Proper shipping name: Pyridine
- Packing group: II

SECTION 15: Regulatory information

**SARA 302 Components**
This material does not contain any components with a section 302 EHS TPQ.

**SARA 313 Components**
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridine</td>
<td>110-86-1</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

**SARA 311/312 Hazards**
Fire Hazard, Acute Health Hazard

<table>
<thead>
<tr>
<th>Reportable Quantity</th>
<th>D038 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F005 lbs</td>
</tr>
</tbody>
</table>

**Massachusetts Right To Know Components**
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

**Further information**
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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