1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name: Diethylamine

Product Number: 471216
Brand: Sigma-Aldrich
Index-No.: 612-003-00-X
REACH No.: A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.
CAS-No.: 109-89-7

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

Identified uses: Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO  63103
USA

Telephone: +1 800-325-5832
Fax: +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone #: (314) 776-6555

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 3), H311
Skin irritation (Category 2), H315
Serious eye damage (Category 1), H318
Respiratory sensitisation (Category 1), H334
Skin sensitisation (Category 1), H317
Acute aquatic toxicity (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 + H332 Harmful if swallowed or if inhaled
H311 Toxic in contact with skin.
H315  Causes skin irritation.
H317  May cause an allergic skin reaction.
H318  Causes serious eye damage.
H334  May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H402  Harmful to aquatic life.

Precautionary statement(s)
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.
P272  Contaminated work clothing should not be allowed out of the workplace.
P273  Avoid release to the environment.
P280  Wear protective gloves/ protective clothing/ eye protection/ face protection.
P285  In case of inadequate ventilation wear respiratory protection.
P301 + P312  IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
P303 + P361 + P353  IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340  IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310  Immediately call a POISON CENTER or doctor/ physician.
P322  Specific measures (see supplemental first aid instructions on this label).
P330  Rinse mouth.
P333 + P313  If skin irritation or rash occurs: Get medical advice/ attention.
P361  Remove/ Take off immediately all contaminated clothing.
P370 + P378  In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
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

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

<table>
<thead>
<tr>
<th>Formula</th>
<th>C_4H_11N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular Weight</td>
<td>73.14 g/mol</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>109-89-7</td>
</tr>
<tr>
<td>EC-No.</td>
<td>203-716-3</td>
</tr>
<tr>
<td>Index-No.</td>
<td>612-003-00-X</td>
</tr>
</tbody>
</table>

Hazardous components

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylamine</td>
<td>Flam. Liq. 2; Acute Tox. 4; Acute Tox. 3; Skin Irrit. 2; Eye Dam. 1; Resp. Sens. 1; Skin Sens. 1; Aquatic Acute 3; H225, H302 + H332, H311, H315, H317, H318, H334,</td>
<td>-</td>
</tr>
</tbody>
</table>
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. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

**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.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

**Suitable extinguishing media**
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

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 fire fighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. 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
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Flash back possible over considerable distance. Container explosion may occur under fire conditions. 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.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 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>Diethylamine</td>
<td>109-89-7</td>
<td>TWA</td>
<td>5 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Remarks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye &amp; Upper Respiratory Tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not classifiable as a human carcinogen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Danger of cutaneous absorption</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>15 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye &amp; Upper Respiratory Tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not classifiable as a human carcinogen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Danger of cutaneous absorption</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>10 ppm</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 mg/m3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>25 ppm</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>75 mg/m3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>25 ppm</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>75 mg/m3</td>
<td></td>
</tr>
</tbody>
</table>

The value in mg/m3 is approximate.

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA</td>
<td>10 ppm</td>
<td>30 mg/m3</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td>ST</td>
<td>25 ppm</td>
<td>75 mg/m3</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). 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: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 159 min
Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)
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 AXBEK (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.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a) Appearance</strong></td>
<td>Form: liquid</td>
</tr>
<tr>
<td><strong>b) Odour</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>c) Odour Threshold</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>d) pH</strong></td>
<td>13 at 100 g/l at 20 °C (68 °F)</td>
</tr>
<tr>
<td><strong>e) Melting point/freezing point</strong></td>
<td>Melting point/range: -50 °C (-58 °F)</td>
</tr>
<tr>
<td><strong>f) Initial boiling point and boiling range</strong></td>
<td>55 °C (131 °F)</td>
</tr>
<tr>
<td><strong>g) Flash point</strong></td>
<td>-23 °C (-9 °F) - closed cup</td>
</tr>
<tr>
<td><strong>h) Evaporation rate</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>i) Flammability (solid, gas)</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>j) Upper/lower flammability or explosive limits</strong></td>
<td>Upper explosion limit: 10.1 % (V) Lower explosion limit: 1.8 % (V)</td>
</tr>
<tr>
<td><strong>k) Vapour pressure</strong></td>
<td>241.936 hPa (181.467 mmHg) at 20 °C (68 °F) 974.637 hPa (731.038 mmHg) at 55 °C (131 °F)</td>
</tr>
<tr>
<td><strong>l) Vapour density</strong></td>
<td>2.53 - (Air = 1.0)</td>
</tr>
<tr>
<td><strong>m) Relative density</strong></td>
<td>0.707 g/mL at 25 °C (77 °F)</td>
</tr>
<tr>
<td><strong>n) Water solubility</strong></td>
<td>soluble</td>
</tr>
<tr>
<td><strong>o) Partition coefficient: n-octanol/water</strong></td>
<td>log Pow: 0.58</td>
</tr>
<tr>
<td><strong>p) Auto-ignition temperature</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>q) Decomposition temperature</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>r) Viscosity</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>s) Explosive properties</strong></td>
<td>no data available</td>
</tr>
</tbody>
</table>
9.2 Other safety information

- Oxidizing properties: no data available

Surface tension: 19.85 mN/m at 25 °C (77 °F)
Relative vapour density: 2.53 - (Air = 1.0)

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.

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Aldehydes, Alcohols, Dicyanofurazan, Ketones, phenols, Acids, Halogenated hydrocarbon, Oxidizing agents, Epoxides

10.6 Hazardous decomposition products
Other decomposition products - no data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - rat - 540 mg/kg
LC50 Inhalation - rat - 4 h - 4000 ppm
LD50 Dermal - rabbit - 577 mg/kg
no data available

Skin corrosion/irritation
Skin - rabbit
Result: Severe skin irritation

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitisation
Germ cell mutagenicity
no data available

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

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

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 identified as a carcinogen or potential carcinogen by OSHA.
Reproductive toxicity
no data available

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available

Additional Information
RTECS: HZ8750000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Lachrymation

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish
LC50 - Oncorhynchus mykiss (rainbow trout) - 25 - 198 mg/l - 96 h
LC50 - Oncorhynchus mykiss (rainbow trout) - 25 - 198 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates
EC50 - Daphnia magna (Water flea) - 56 mg/l - 48 h
EC50 - Daphnia magna (Water flea) - 56 mg/l - 48 h

Toxicity to algae
EC50 - Algae - 20 mg/l - 96 h
EC50 - Pseudokirchneriella subcapitata (green algae) - 20 mg/l - 96 h

Toxicity to bacteria
- Bacteria - 47 mg/l - 17 h

12.2 Persistence and degradability

Biodegradability
Biotic/Aerobic - Exposure time 28 d
Result: 75 % - Readily biodegradable.

12.3 Bioaccumulative potential
no data available

12.4 Mobility in soil
no data available

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.
Do not empty into drains.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

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

Contaminated packaging
Dispose of as unused product.
14. TRANSPORT INFORMATION

**DOT (US)**
- UN number: 1154
- Class: 3 (8)
- Packing group: II
- Proper shipping name: Diethylamine
- Reportable Quantity (RQ): 100 lbs
- Marine pollutant: No
- Poison Inhalation Hazard: No

**IMDG**
- UN number: 1154
- Class: 3 (8)
- Packing group: II
- EMS-No: F-E, S-C
- Proper shipping name: DIETHYLAMINE
- Marine pollutant: No

**IATA**
- UN number: 1154
- Class: 3 (8)
- Packing group: II
- Proper shipping name: Diethylamine

15. REGULATORY INFORMATION

**REACH No.**
- A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

**SARA 302 Components**
- SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**
- SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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

**Massachusetts Right To Know Components**
- Diethylamine: CAS-No. 109-89-7, Revision Date 2007-03-01

**Pennsylvania Right To Know Components**
- Diethylamine: CAS-No. 109-89-7, Revision Date 2007-03-01

**New Jersey Right To Know Components**
- Diethylamine: CAS-No. 109-89-7, Revision Date 2007-03-01

**California Prop. 65 Components**
- This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

**Full text of H-statements referred to under sections 2 and 3.**
- Acute Tox.: Acute toxicity
- Aquatic Acute: Acute aquatic toxicity
- Eye Dam.: Serious eye damage
- Flam. Liq.: Flammable liquids
- H225: Highly flammable liquid and vapour.
- H302: Harmful if swallowed.
- H302 + H332: Harmful if swallowed or if inhaled
- H311: Toxic in contact with skin.
- H315: Causes skin irritation.
- H317: May cause an allergic skin reaction.
H318 Causes serious eye damage.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H402 Harmful to aquatic life.

**HMIS Rating**
Health hazard: 3
Chronic Health Hazard: *
Flammability: 3
Physical Hazard 0

**NFPA Rating**
Health hazard: 3
Fire Hazard: 3
Reactivity Hazard: 0

**Further information**
Copyright 2014 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only. 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 Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

**Preparation Information**
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.1 Revision Date: 02/24/2014 Print Date: 02/27/2014