Section 1 - Product and Company Information

Product Name: ETHYLBENZENE, 99%
Product Number: E12508
Brand: ALDRICH
Company: Sigma-Aldrich
Street Address: 3050 Spruce Street
City, State, Zip, Country: SAINT LOUIS MO 63103 US
Technical Phone: 314 771 5765
Emergency Phone: 414 273 3850 Ext. 5996
Fax: 800 325 5052

Section 2 - Composition/Information on Ingredient

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS #</th>
<th>SARA 313</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLBENZENE</td>
<td>100-41-4</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Formula: C8H10
Synonyms: Aethylbenzol (German) * Ethylbenzeen (Dutch) * Ethyl benzene (ACGIH:OSHA) * Ethylbenzol * Etilbenzene (Italian) * Etylobenzen (Polish) * NCI-C56393 * Phenylethane
RTECS Number: DA0700000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

HMIS RATING
HEALTH: 2*
FLAMMABILITY: 3
REACTIVITY: 1

NFPA RATING
HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

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 contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS
Flammable Hazards: Yes

EXPLOSION HAZARDS
Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

FLASH POINT
59 °F  15 °C  Method: closed cup

EXPLOSION LIMITS
Lower: 1 %  Upper: 6.7 %

AUTOIGNITION TEMP
432 °C

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.
Unsuitable: Water may be effective for cooling, but may not effect extinguishment.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Vapor may travel considerable distance to source of ignition and flash back. Flammable liquid.
Specific Method(s) of Fire Fighting: Use water spray to cool fire-exposed containers.

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 respirator, chemical safety goggles, 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: Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep container closed. Keep away from heat, sparks, and open flame.

SPECIAL REQUIREMENTS
Hygroscopic.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

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>TWA</td>
<td>100 PPM</td>
</tr>
<tr>
<td>USA</td>
<td>MSHA Standard-air</td>
<td>TWA</td>
<td>100 PPM (435 MG/M3)</td>
</tr>
<tr>
<td>USA</td>
<td>OSHA.</td>
<td>PEL</td>
<td>8H TWA 100 PPM (435 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>100 PPM</td>
</tr>
<tr>
<td>USA</td>
<td>NIOSH</td>
<td>STEL</td>
<td>125 PPM</td>
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</table>

EXPOSURE LIMITS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>NDS</td>
<td>TWA</td>
<td>100 MG/M3</td>
</tr>
<tr>
<td>Poland</td>
<td>NDSCh</td>
<td></td>
<td>350 MG/M3</td>
</tr>
<tr>
<td>Poland</td>
<td>NDSP</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
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</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Physical State: Liquid Color: Colorless</td>
<td></td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>106.17 AMU</td>
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</tr>
<tr>
<td>pH</td>
<td>N/A</td>
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<tr>
<td>BP/Boiling Point</td>
<td>136 - 137 °C</td>
<td></td>
</tr>
<tr>
<td>MP/Melting Point</td>
<td>-95 °C</td>
<td></td>
</tr>
<tr>
<td>Freezing Point</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>10 mmHg</td>
<td>20 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>3.7 g/l</td>
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</tr>
<tr>
<td>Saturated Vapor Concentration</td>
<td>N/A</td>
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<tr>
<td>SG/Density</td>
<td>0.867 g/cm³</td>
<td></td>
</tr>
<tr>
<td>Bulk Density</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>N/A</td>
<td></td>
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</tbody>
</table>
Volatile%  N/A
VOC Content  N/A
Water Content  N/A
Solvent Content  N/A
Evaporation Rate  N/A
Viscosity  N/A
Surface Tension  N/A
Partition Coefficient  N/A
Decomposition Temp.  N/A
Flash Point  59 °F 15 °C  Method: closed cup
Explosion Limits  Lower: 1 %
                 Upper: 6.7 %
Flammability  N/A
Autoignition Temp  432 °C
Refractive Index  1.495
Optical Rotation  N/A
Miscellaneous Data  N/A
Solubility  N/A
N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Conditions to Avoid: Protect from moisture.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
Skin Contact: May cause skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes severe eye irritation.
Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. Harmful if inhaled.
Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)
Central nervous system. Blood.

SIGNS AND SYMPTOMS OF EXPOSURE
Can cause CNS depression. Exposure can cause: Nausea, headache, and vomiting. Ataxia. Tremors.

TOXICITY DATA

Oral
Rat
3500 mg/kg
LD50
Remarks: Liver:Other changes. Kidney, Ureter, Bladder:Other changes.

Intraperitoneal
Mouse
2624 UL/KG
LD50

Skin
Rabbit
17800 UL/KG
LD50

IRRITATION DATA

Skin
Rabbit
15 mg
24H
Remarks: Open irritation test

Eyes
Rabbit
500 mg
Remarks: Severe irritation effect

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.

Species: Rat
Route of Application: Inhalation
Dose: 750 PPM
Exposure Time: 6H/2Y
Frequency: I

Species: Mouse
Route of Application: Inhalation
Dose: 750 PPM
Exposure Time: 6H/2Y
Frequency: I

NTP CARCINOGEN LIST
Rating: Clear evidence.
Route: Inhalation

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 985 PPM/7H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 96 PPM/7H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.
Species: Rat  
Dose: 2400 MG/M3/24H  
Route of Application: Inhalation  
Exposure Time: (7-15D PREG)  
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rabbit  
Dose: 500 MG/M3/24H  
Route of Application: Inhalation  
Exposure Time: (7-20D PREG)  
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

CHRONIC EXPOSURE - MUTAGEN

Species: Human  
Dose: 10 MMOL/L  
Cell Type: lymphocyte  
Mutation test: Sister chromatid exchange

Species: Mouse  
Dose: 80 MG/L  
Cell Type: lymphocyte  
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster  
Dose: 25 MG/L  
Cell Type: Embryo  
Mutation test: Micronucleus test

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat  
Dose: 97 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (15D PRE)  
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Rat  
Dose: 600 MG/M3/24H  
Route of Application: Inhalation  
Exposure Time: (7-15D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).  
Effects on Embryo or Fetus: Fetal death. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rabbit  
Dose: 99 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (1-18D PREG)  
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Rabbit  
Dose: 1 GM/M3/24H  
Route of Application: Inhalation  
Exposure Time: (7-20D PREG)
Result: Effects on Fertility: Abortion.

Section 12 - Ecological Information

N/A

ACUTE ECOTOXICITY TESTS
Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 2.9 mg/l

Test Type: LC50 Fish
Species: Cyprinodon variegatus (Sheepshead minnow)
Time: 96 h
Value: 88 mg/l

Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 96 h
Value: 80 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: Ethylbenzene
UN#: 1175
Class: 3
Packing Group: Packing Group II
Hazard Label: Flammable liquid
PIH: Not PIH

IATA
Proper Shipping Name: Ethylbenzene
IATA UN Number: 1175
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: F Xn
R: 11 20
Risk Statements: Highly flammable. Harmful by inhalation.
S: 16 24/25 29
Safety Statements: Keep away from sources of ignition – no smoking. Avoid contact with skin and eyes. Do not empty into drains.

US CLASSIFICATION AND LABEL TEXT
Risk Statements: Harmful by inhalation. Risk of serious damage to eyes.
Safety Statements: Keep away from sources of ignition - no smoking. Avoid contact with skin and eyes. Do not empty into drains.

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.
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