SAFETY DATA SHEET

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

1.1 Product identifiers

Product name: Ethylbenzene

Product Number: 296848
Brand: Sigma-Aldrich
Index-No.: 601-023-00-4
CAS-No.: 100-41-4

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 ST
ST. LOUIS MO 63103
UNITED STATES

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

1.4 Emergency telephone

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, Inhalation (Category 4), H332
- Carcinogenicity (Category 2), H351
- Specific target organ toxicity - repeated exposure (Category 2), hearing organs, H373
- Aspiration hazard (Category 1), H304
- Short-term (acute) aquatic hazard (Category 2), H401
- Long-term (chronic) aquatic hazard (Category 3), H412

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

2.2 GHS Label elements, including precautionary statements

Sigma-Aldrich - 296848
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>Formula</th>
<th>Molecular weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>C₈H₁₀</td>
<td>106.17 g/mol</td>
</tr>
</tbody>
</table>

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada.
 SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed

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
Water Carbon dioxide (CO2) Foam Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

For the full text of the H-Statements mentioned in this Section, see Section 16.
5.2 Special hazards arising from the substance or mixture
- Carbon oxides
- Combustible.
- Pay attention to flashback.
- Vapors are heavier than air and may spread along floors.
- Development of hazardous combustion gases or vapours possible in the event of fire.
- Forms explosive mixtures with air at ambient temperatures.

5.3 Advice for firefighters
- Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
- Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures
6.1 Personal precautions, protective equipment and emergency procedures
- Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2 Environmental precautions
- Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
- Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

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

SECTION 7: Handling and storage
7.1 Precautions for safe handling
- Advice on safe handling
  - Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.
- Advice on protection against fire and explosion
  - Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.
- Hygiene measures
  - Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.
  - For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
- Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

**Storage class**
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

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**SECTION 8: Exposure controls/personal protection**

#### 8.1 Control parameters

**Ingredients 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>ethylbenzene</td>
<td>100-41-4</td>
<td>TWA 100 ppm</td>
<td>435 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ST 125 ppm</td>
<td>545 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA 100 ppm</td>
<td>435 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL 30 ppm</td>
<td>130 mg/m³</td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PEL 5 ppm</td>
<td>22 mg/m³</td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
</tbody>
</table>

**Biological occupational exposure limits**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Parameters</th>
<th>Value</th>
<th>Biological specimen</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>ethylbenzene</td>
<td>100-41-4</td>
<td>Sum of mandelic acid and phenyl glyoxylic acid</td>
<td>0.15g/g creatinin</td>
<td>Urine</td>
<td>ACGIH - Biological Exposure Indices (BEI)</td>
</tr>
</tbody>
</table>

**Remarks** End of shift (As soon as possible after exposure ceases)

#### 8.2 Exposure controls

**Appropriate engineering controls**
Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.
Personal protective equipment

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

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
- Material: Viton®
  - Minimum layer thickness: 0.7 mm
  - Break through time: 480 min
- Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
- Material: Nitrile rubber
  - Minimum layer thickness: 0.4 mm
  - Break through time: 10 min
- Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance
   - Form: liquid
   - Color: colorless

b) Odor
   - aromatic

c) Odor Threshold
   - No data available

d) pH
   - No data available

e) Melting point/freezing point
   - Melting point: -94.9 °C (-138.8 °F) at 101.3 hPa - (ECHA)

f) Initial boiling point
   - 136.1 °C 277.0 °F at 1,013.3 hPa
and boiling range

- **g)** Flash point: 22.0 °C (71.6 °F) - closed cup

- **h)** Evaporation rate: No data available

- **i)** Flammability (solid, gas): No data available

- **j)** Upper/lower flammability or explosive limits:
  - Upper explosion limit: 6.7% (V)
  - Lower explosion limit: 1% (V)

- **k)** Vapor pressure: 9.52 hPa at 20 °C (68 °F) - OECD Test Guideline 104

- **l)** Vapor density: No data available

- **m)** Density: 0.87 g/cm³ at 20 °C (68 °F)
  - Relative density: 0.86 - 0.8720 °C

- **n)** Water solubility: 0.2 g/l at 25 °C (77 °F) - Regulation (EC) No. 440/2008, Annex, A.6 - slightly soluble

- **o)** Partition coefficient: n-octanol/water
  - log Pow: 3.6 at 20 °C (68 °F) - Regulation (EC) No. 440/2008, Annex, A.8 - Bioaccumulation is not expected.

- **p)** Autoignition temperature: 430 °C (806 °F) at 1,013 hPa

- **q)** Decomposition temperature: No data available

- **r)** Viscosity: 0.773 mm²/s at 20 °C (68 °F) - OECD Test Guideline 114 - 0.641 mm²/s at 40 °C (104 °F) - OECD Test Guideline 114 -

- **s)** Explosive properties: No data available

- **t)** Oxidizing properties: none

### 9.2 Other safety information

- **Surface tension:** 71.2 mN/m at 0.058g/l at 23 °C (73 °F) - Surface tension

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**SECTION 10: Stability and reactivity**

**10.1 Reactivity**

Vapors may form explosive mixture with air.

**10.2 Chemical stability**

The product is chemically stable under standard ambient conditions (room temperature).

**10.3 Possibility of hazardous reactions**

Violent reactions possible with:
- Strong oxidizing agents
- Rubber
- Various plastics

**10.4 Conditions to avoid**

Warming.

Sigma-Aldrich - 296848
10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

**Acute toxicity**
LD50 Oral - Rat - male and female - 3,500 mg/kg
Remarks: (ECHA)
LC50 Inhalation - Rat - male - 4 h - 17.8 mg/l - vapor
Remarks: (ECHA)
LD50 Dermal - Rabbit - 15,433 mg/kg
Remarks: (RTECS)

**Skin corrosion/irritation**
Skin - Rabbit
Result: Moderate skin irritation - 24 h
Remarks: (ECHA)

**Serious eye damage/eye irritation**
Eyes - Rabbit
Result: Mild eye irritation
Remarks: (ECHA)

**Respiratory or skin sensitization**
No data available

**Germ cell mutagenicity**
Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Oral
Method: OECD Test Guideline 474
Result: negative

Test Type: unscheduled DNA synthesis assay
Species: Mouse
Application Route: Inhalation
Method: OECD Test Guideline 486
Result: negative

**Carcinogenicity**

IARC: 2B - Group 2B: Possibly carcinogenic to humans (ethylbenzene)
NTP: No ingredient 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**
No data available

**Specific target organ toxicity - repeated exposure**
May cause damage to organs through prolonged or repeated exposure.
- hearing organs

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Aspiration hazard**
Aspiration may cause pulmonary edema and pneumonitis.

### 11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 28 d - NOAEL (No observed adverse effect level) - 75 mg/kg

RTECS: DA0700000
Central nervous system depression, Nausea, Headache, Vomiting, Ataxia., Tremors
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Systemic effects:

- CNS disorders
- Tiredness
- Drowsiness
- Dizziness
- Convulsions
- Headache
- narcosis

Handle in accordance with good industrial hygiene and safety practice.

- Stomach - Irregularities - Based on Human Evidence
- Stomach - Irregularities - Based on Human Evidence
SECTION 12: Ecological information

12.1 Toxicity

**Toxicity to fish**
semi-static test LC50 - Oncorhynchus mykiss (rainbow trout) - 4.2 mg/l - 96 h
(OECD Test Guideline 203)

**Toxicity to daphnia and other aquatic invertebrates**
static test EC50 - Daphnia magna (Water flea) - 1.8 - 2.4 mg/l - 48 h
(US-EPA)

**Toxicity to algae**
static test EC50 - Pseudokirchneriella subcapitata (green algae) - 3.6 mg/l - 96 h
(US-EPA)

**Toxicity to bacteria**
EC50 - Photobacterium phosphoreum - 9.68 mg/l - 30 min
Remarks: (IUCLID)

12.2 Persistence and degradability

**Biodegradability**
aerobic - Exposure time 28 d
Result: ca.79 % - Readily biodegradable.
(ISO 14593)

12.3 Bioaccumulative potential
Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected.

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 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product**
Waste material must be disposed of in accordance with the national and local regulations.
Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.
### SECTION 14: Transport information

**DOT (US)**
- UN number: 1175  
- Class: 3  
- Packing group: II  
- Proper shipping name: Ethylbenzene  
- Reportable Quantity (RQ): 1000 lbs  
- Reportable Quantity (RQ): 100 lbs  
- Poison Inhalation Hazard: No

**IMDG**
- UN number: 1175  
- Class: 3  
- Packing group: II  
- Proper shipping name: ETHYLBENZENE  
- EMS-No: F-E, S-D

**IATA**
- UN number: 1175  
- Class: 3  
- Packing group: II  
- Proper shipping name: Ethylbenzene

### 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>ethylbenzene</td>
<td>100-41-4</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

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

**Reportable Quantity**: F003 lbs

**Massachusetts Right To Know Components**

<table>
<thead>
<tr>
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<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

**Pennsylvania Right To Know Components**

<table>
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<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2007-07-01</td>
</tr>
</tbody>
</table>

**California Prop. 65 Components**

<table>
<thead>
<tr>
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<th>CAS-No.</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ethylbenzene</td>
<td>100-41-4</td>
<td>2007-09-28</td>
</tr>
</tbody>
</table>

, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.ethylbenzene
SECTION 16: Other information

Further information

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.

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