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
**Pictogram**

---

**Signal Word** Danger

**Hazard statement(s)**
- **H225** Highly flammable liquid and vapor.
- **H304** May be fatal if swallowed and enters airways.
- **H332** Harmful if inhaled.
- **H351** Suspected of causing cancer.
- **H373** May cause damage to organs (hearing organs) through prolonged or repeated exposure.
- **H401** Toxic to aquatic life.
- **H412** Harmful to aquatic life with long lasting effects.

**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.
- **P260** Do not breathe mist or vapors.
- **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 + P310** IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
- **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.
- **P308 + P313** IF exposed or concerned: Get medical advice/ attention.
- **P331** Do NOT induce vomiting.
- **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**
- **Formula** : $C_8H_{10}$
- **Molecular weight** : 106.17 g/mol
CAS-No. : 100-41-4  
EC-No. : 202-849-4  
Index-No. : 601-023-00-4

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ethylbenzene</td>
<td>Flam. Liq. 2; Acute Tox. 4; Carc. 2; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 3; H225, H332, H351, H373, H304, H401, H412</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
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.
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

SECTION 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>ethylbenzene</td>
<td>100-41-4</td>
<td>TWA</td>
<td>100 ppm 435 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ST</td>
<td>125 ppm 545 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>100 ppm 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</td>
<td>30 ppm 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</td>
<td>5 ppm 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**

<table>
<thead>
<tr>
<th>a) Appearance</th>
<th>Form: liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) Odor</td>
<td>aromatic</td>
</tr>
<tr>
<td>c) Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>d) pH</td>
<td>No data available</td>
</tr>
<tr>
<td>e) Melting point/freezing point</td>
<td>Melting point: -94.9 °C (-138.8 °F) at 101.3 hPa - (ECHA)</td>
</tr>
<tr>
<td>f) Initial boiling point</td>
<td>136.1 °C 277.0 °F at 1,013.3 hPa</td>
</tr>
</tbody>
</table>
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
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 0.058 g/l at 23 °C (73 °F) - Surface tension

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 uncleansed 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  EMS-No: F-E, S-D
- Proper shipping name: ETHYLBENZENE

**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**
- ethylbenzene  CAS-No. 100-41-4  Revision Date 2007-07-01

**Pennsylvania Right To Know Components**
- ethylbenzene  CAS-No. 100-41-4  Revision Date 2007-07-01

**California Prop. 65 Components**
, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.ethylbenzene

CAS-No. 100-41-4  Revision Date 2007-09-28
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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Version: 6.8 Revision Date: 05/25/2023 Print Date: 08/12/2023