

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Toluene
Product Number : 155004
Brand : Sigma-Aldrich
Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +18003255832
Fax : +18003255052
Emergency Phone # : (314) 776-6555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : C₇H₈
Molecular Weight : 92.14 g/mol

| CAS-No. | EC-No. | Index-No. | Concentration |
|----------------|-----------|--------------|---------------|
| Toluene | | | |
| 108-88-3 | 203-625-9 | 601-021-00-3 | - |

3. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards

Flammable Liquid, Irritant, Teratogen, Reproductive hazard

Target Organs

Bladder, Liver, Kidney, Brain.

HMIS Classification

Health Hazard: 2
Chronic Health Hazard: *
Flammability: 3
Physical hazards: 0

NFPA Rating

Health Hazard: 2
Fire: 3
Reactivity Hazard: 0

Potential Health Effects

Inhalation May be harmful if inhaled. Causes respiratory tract irritation. Vapours may cause drowsiness and dizziness.

| | |
|------------------|---|
| Skin | May be harmful if absorbed through skin. Causes skin irritation. |
| Eyes | Causes eye irritation. |
| Ingestion | Aspiration hazard if swallowed - can enter lungs and cause damage. May be harmful if swallowed. |

4. FIRST AID MEASURES

General advice

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

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.

5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point 4.0 °C (39.2 °F) - closed cup

Ignition temperature 535 °C (995 °F)

Suitable extinguishing media

For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective equipment. Avoid breathing vapors, 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.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods for cleaning up

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).

7. HANDLING AND STORAGE

Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Storage

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. Store in cool place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

| Components | CAS-No. | Value | Control parameters | Update | Basis |
|------------|----------------|-------|----------------------------------|------------|---|
| Toluene | 108-88-3 | TWA | 100 ppm 375 mg/m ³ | 1989-03-01 | US. Department of Labor - Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000 Z-1-A |
| Remarks | See Table Z-2. | | | | |
| | | STEL | 150 ppm 560 mg/m ³ | 1989-03-01 | US. Department of Labor - Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000 Z-1-A |
| | See Table Z-2. | | | | |
| | | TWA | 200 ppm | 1993-06-30 | US. Department of Labor - Occupational Safety and Health Administration; (OSHA) Standards, Toxic and Hazardous Substances, Subpart Z 29 CFR Part 1910.1000, Table Z-2 |
| | (Z37.12-1967) | | | | |
| | | CEIL | 300 ppm | 1993-06-30 | US. Department of Labor - Occupational Safety and Health Administration; (OSHA) Standards, Toxic and Hazardous Substances, Subpart Z 29 CFR Part 1910.1000, Table Z-2 |
| | (Z37.12-1967) | | | | |
| | | AMP | 500 ppm | 1993-06-30 | US. Department of Labor - Occupational Safety and Health Administration; (OSHA) Standards, Toxic and Hazardous Substances, Subpart Z 29 CFR Part 1910.1000, Table Z-2 |
| | (Z37.12-1967) | | | | |
| | | TWA | 20 ppm | 2006-11-17 | US. American Conference of Governmental and |

| | | | | | |
|--|--|--|--|--|---|
| | | | | | Industrial Hygienists Threshold Limit Values for Chemical Substances in the Work Environment; Annual Reports for the Year 2004: Committees on Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) |
| | | | | | The agent (mixture , or exposure circumstance) is not classifiable as to its carcinogenicity to humans . |

Personal protective equipment

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).

Hand protection

Handle with gloves.

Eye protection

Safety glasses

Skin and body protection

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

| | |
|--------|------------|
| Form | liquid |
| Colour | colourless |

Safety data

| | |
|-----------------------|---|
| pH | no data available |
| Melting point | -93.0 °C (-135.4 °F) |
| Boiling point | 110.6 °C (231.1 °F) |
| Flash point | 4.0 °C (39.2 °F) - closed cup |
| Ignition temperature | 535 °C (995 °F) |
| Lower explosion limit | 1.2 %(V) |
| Upper explosion limit | 7 %(V) |
| Vapour pressure | 29.1 hPa (21.8 mmHg) at 20.0 °C (68.0 °F) |
| Density | 0.86 g/cm ³ at 25.00 °C (77.00 °F) |
| Water solubility | no data available |

10. STABILITY AND REACTIVITY

Storage stability

Stable under recommended storage conditions.

Conditions to avoid

Heat, flames and sparks.

Materials to avoid

Strong oxidizing agents

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Hazardous reactions

Vapours may form explosive mixture with air.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - rat - > 5,580 mg/kg

LC50 Inhalation - rat - 4 h - 12,500 - 28,800 mg/m³

LD50 Dermal - rabbit - 12,196 mg/kg

Irritation and corrosion

Skin - rabbit - Skin irritation - 24 h

Eyes - rabbit - Severe eye irritation - 24 h

Sensitisation

no data available

Chronic exposure

IARC: Group 3 - Not classifiable as to carcinogenicity to humans (Toluene)

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.

Developmental Toxicity - rat - Oral

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Damage to fetus possible

Reproductive toxicity - rat - Inhalation

Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Experiments have shown reproductive toxicity effects in male and female laboratory animals.

Signs and Symptoms of Exposure

Lung irritation, chest pain, pulmonary edema, Inhalation studies on toluene have demonstrated the development of inflammatory and ulcerous lesions of the penis, prepuce, and scrotum in animals.

Potential Health Effects

Inhalation

May be harmful if inhaled. Causes respiratory tract irritation. Vapours may cause

Skin drowsiness and dizziness.
Eyes May be harmful if absorbed through skin. Causes skin irritation.
Ingestion Causes eye irritation.
Aspiration hazard if swallowed - can enter lungs and cause damage. May be harmful if swallowed.
Target Organs Bladder, Liver, Kidney, Brain.,

Additional Information

RTECS: XS5250000

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

Bioaccumulation Leuciscus idus (Golden orfe) - 3 d
Bioconcentration factor (BCF): 94

Ecotoxicity effects

Toxicity to fish LC50 - Lepomis macrochirus (Bluegill) - 74.00 - 340.00 mg/l - 96 h
LC50 - Oncorhynchus mykiss (rainbow trout) - 7.63 mg/l - 96 h
NOEC - Pimephales promelas (fathead minnow) - 5.44 mg/l - 7 d
LOEC - Pimephales promelas (fathead minnow) - 8.04 mg/l - 7 d

Toxicity to daphnia and other aquatic invertebrates. EC50 - Daphnia magna (Water flea) - 8.00 mg/l - 24 h
Immobilization EC50 - Daphnia magna (Water flea) - 6 mg/l - 48 h

Toxicity to algae EC50 - Chlorella vulgaris (Fresh water algae) - 245.00 mg/l - 24 h
EC50 - Pseudokirchneriella subcapitata (green algae) - 10.00 mg/l - 24 h

Further information on ecology

no data available

13. DISPOSAL CONSIDERATIONS

Product

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. 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: 1294 Class: 3 Packing group: II
Proper shipping name: Toluene
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG

UN-Number: 1294 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: TOLUENE
Marine pollutant: No

IATA

UN-Number: 1294 Class: 3
Proper shipping name: Toluene

Packing group: II

15. REGULATORY INFORMATION**OSHA Hazards**

Flammable Liquid, Irritant, Teratogen, Reproductive hazard

DSL Status

All components of this product are on the Canadian DSL list.

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

| | CAS-No. | Revision Date |
|---------|----------|---------------|
| Toluene | 108-88-3 | 1987-01-01 |

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

| | CAS-No. | Revision Date |
|---------|----------|---------------|
| Toluene | 108-88-3 | 1987-01-01 |

Pennsylvania Right To Know Components

| | CAS-No. | Revision Date |
|---------|----------|---------------|
| Toluene | 108-88-3 | 1987-01-01 |

New Jersey Right To Know Components

| | CAS-No. | Revision Date |
|---------|----------|---------------|
| Toluene | 108-88-3 | 1987-01-01 |

California Prop. 65 Components

| | CAS-No. | Revision Date |
|--|----------|---------------|
| WARNING! This product contains a chemical known in the State of California to cause birth defects or other reproductive harm. Toluene | 108-88-3 | 1992-05-09 |

16. OTHER INFORMATION**Further information**

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