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SIGMA-ALDRICH

Material Safety Data Sheet

Version 3.0
Revision Date 07/13/2007
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1. PRODUCT AND COMPANY IDENTIFICATION

Product name : **Styrene**

Product Number : S4972
Brand : Sigma-Aldrich

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # : (314) 776-6555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Phenylethylene
Vinylbenzene

Formula : C8H8
Molecular Weight : 104.15 g/mol

CAS-No.	EC-No.	Index-No.	Concentration [%]
Styrene			
100-42-5	202-851-5	601-026-00-0	-

3. HAZARDS IDENTIFICATION

Emergency Overview
OSHA Hazards
Flammable Liquid
Irritant
Carcinogen
Target Organs
Central nervous system, Blood, Lymphatic system., Endocrine system.

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. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.

4. 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. 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 32.0 °C (89.6 °F) - closed cup

Ignition temperature 480 °C (896 °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.

Specific hazards
Container explosion may occur under fire conditions. Vapours may form explosive mixture with air.

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. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
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). Keep in suitable, closed containers for disposal.

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.Store in cool place.

Light sensitive.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
Styrene	100-42-5	TWA	20 ppm 85 mg/m3	1997-05-21	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)
		STEL	40 ppm 170 mg/m3	1997-05-21	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)
		TWA	50 ppm 215 mg/m3	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	100 ppm 425 mg/m3	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	100 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

	(Z37.15-1969)				
		CEIL	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
	(Z37.15-1969)				
		AMP	600 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
	(Z37.15-1969)				

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, clear
Colour	colourless

Safety data

pH	no data available
Melting point	-31.0 °C (-23.8 °F)
Boiling point	145.0 - 146.0 °C (293.0 - 294.8 °F)
Flash point	32.0 °C (89.6 °F) - closed cup
Ignition temperature	480 °C (896 °F)
Lower explosion limit	1.1 %(V)
Upper explosion limit	8.9 %(V)

Vapour pressure	16.5 hPa (12.4 mmHg) at 37.7 °C (99.9 °F) 5.7 hPa (4.3 mmHg) at 15.0 °C (59.0 °F)
Density	0.91 g/cm3
Water solubility	insoluble

10. STABILITY AND REACTIVITY

Storage stability
Stable under recommended storage conditions.

Conditions to avoid
Heat, flames and sparks.
May polymerize on exposure to light.

Materials to avoid
Oxidizing agents, Copper

Hazardous reactions
Vapours may form explosive mixture with air.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - rat - 2,650 mg/kg
Remarks: Behavioral:Somnolence (general depressed activity). Liver:Other changes.

LC50 Inhalation - rat - 4 h - 12,000 mg/m3

Irritation and corrosion

Skin - rabbit - Skin irritation

Eyes - rabbit - Eye irritation - 24 h

Sensitisation

no data available

Chronic exposure

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Laboratory experiments have shown mutagenic effects.

Signs and Symptoms of Exposure

Dermatitis, Central nervous system depression, Nausea, Dizziness, Headache

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.
Target Organs	Central nervous system, Blood, Lymphatic system., Endocrine system.,

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

Biodegradability

Ecotoxicity effects

Toxicity to fish	LC50 - Leuciscus idus (Golden orfe) - 17.00 - 66.00 mg/l - 48 h
	NOEC - Pimephales promelas (fathead minnow) - 4 mg/l - 96 h
	LC50 - Pimephales promelas (fathead minnow) - 4.08 mg/l - 96 h
	LOEC - Pimephales promelas (fathead minnow) - 7.6 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates.	EC50 - Daphnia magna (Water flea) - 182.00 mg/l - 24 h
	NOEC - Daphnia magna (Water flea) - 1.9 mg/l - 48 h
	LOEC - Daphnia magna (Water flea) - 3.3 mg/l - 48 h
	EC50 - Daphnia magna (Water flea) - 4.7 mg/l - 48 h

Further information on ecology

no data available

13. DISPOSAL CONSIDERATIONS

Product
Contact a licensed professional waste disposal service to dispose of this material.This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. 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.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 2055 Class: 3 Packing group: III
Proper shipping name: Styrene monomer, stabilized

IMDG
UN-Number: 2055 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: STYRENE MONOMER, STABILIZED
Marine pollutant: No

IATA
UN-Number: 2055 Class: 3 Packing group: III
Proper shipping name: Styrene monomer, stabilized

15. REGULATORY INFORMATION

OSHA Hazards
Flammable Liquid, Irritant, Carcinogen

TSCA Status
On TSCA Inventory

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
Styrene	100-42-5	1987-01-01

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

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Styrene	100-42-5	1987-01-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Styrene	100-42-5	1987-01-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Styrene	100-42-5	1987-01-01

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

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 Co., 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.