



MATERIAL SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Date of issue: 03/11/2013

Version 1.0

SECTION 1. Identification

Product identifier

Product number	807679
Product name	Styrene (stabilised) for synthesis

Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Chemical for synthesis
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America SDS Phone Support: +1-978-715-1335 General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5) e-mail: mm_sds@merckgroup.com
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification

GHS Classification

Flammable liquid, Category 3, H226
Acute toxicity, Category 4, Inhalation, H332
Skin irritation, Category 2, H315
Eye irritation, Category 2, H319
Acute aquatic toxicity, Category 1, H400

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

GHS-Labeling

Hazard pictograms



Signal Word
Warning

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Hazard Statements

H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H400 Very toxic to aquatic life.

Precautionary Statements

P210 Keep away from heat.
P273 Avoid release to the environment.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

OSHA Hazards

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula	$\text{C}_6\text{H}_5\text{CHCH}_2$	C_8H_8 (Hill)
CAS-No.	100-42-5	
Molar mass	104.15 g/mol	

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

styrene (>= 90 % - <= 100 %)

100-42-5

SECTION 4. First aid measures

Description of first-aid measures

Inhalation

After inhalation: fresh air. If breathing stops: mouth-to-mouth breathing or artificial respiration.
Oxygen if necessary. Immediately call in physician.

Skin contact

After skin contact: wash off with plenty of water. Remove contaminated clothing.

Eye contact

After eye contact: rinse out with plenty of water. Call in ophthalmologist.

Ingestion

After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

Never give anything by mouth to an unconscious person.

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Most important symptoms and effects, both acute and delayed

irritant effects, Dermatitis, Dizziness, Vomiting, Tiredness
Drying-out effect resulting in rough and chapped skin.

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Carbon dioxide (CO₂), Foam, Dry powder

Unsuitable extinguishing media

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

Special hazards arising from the substance or mixture

Combustible.

Development of hazardous combustion gases or vapors possible in the event of fire.

Forms explosive mixtures with air at elevated temperatures.

Explosive decomposition possible on heating.

Vapors are heavier than air and may spread along floors.

Advice for firefighters

Special protective equipment for fire-fighters

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

Further information

Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapors, aerosols. Ensure adequate ventilation. Keep away from open flames, hot surfaces and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions

Do not empty into drains. Risk of explosion.

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 with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Observe label precautions.

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Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Conditions for safe storage, including any incompatibilities

Keep away from heat and sources of ignition. Keep container tightly closed in a dry and well-ventilated place.

Store below +15°C (+59°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
<i>styrene 100-42-5</i>			
ACGIH	Time Weighted Average (TWA):	20 ppm	
	Short Term Exposure Limit (STEL):	40 ppm	
NIOSH/GUIDE	Short Term Exposure Limit (STEL):	100 ppm	
		425 mg/m ³	
	Recommended exposure limit (REL):	50 ppm	
Z1A		215 mg/m ³	
	Time Weighted Average (TWA):	50 ppm	
		215 mg/m ³	
	Short Term Exposure Limit (STEL):	100 ppm	
		425 mg/m ³	
OSHA/Z2	Ceiling Limit Value:	200 ppm	
	Maximum concentration:	600 ppm	Ceiling Limit Value 5 minutes in any 3 hours
	Time Weighted Average (TWA):	100 ppm	

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Safety glasses

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Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:

Flame retardant antistatic protective clothing

Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	sweet
Odor Threshold	No information available.
pH	No information available.
Melting point	-31 °C
Boiling point/boiling range	293 °F (145 °C) at 1,013 hPa
Flash point	88 °F (31 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.1 %(V)
Upper explosion limit	8.9 %(V)
Vapor pressure	6 hPa at 68 °F (20 °C)
Relative vapor density	3.59
Relative density	0.906 g/cm ³ at 68 °F (20 °C)
Water solubility	0.24 g/l at 68 °F (20 °C)

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Partition coefficient: n-octanol/water	log Pow: 2.96 OECD Test Guideline 107 Bioaccumulation is not expected (log Pow <1).
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	0.762 mPa.s at 68 °F (20 °C)
Explosive properties	Not classified as explosive.
Ignition temperature	896 °F (480 °C)
Saturated vapor concentration	25.6 g/m ³ at 68 °F (20 °C)

SECTION 10. Stability and reactivity

Reactivity

Vapor/air-mixtures are explosive at intense warming.

Chemical stability

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

Stabilizer

4-tert-butylpyrocatechol

Possibility of hazardous reactions

Exothermic reaction with:

chlorosulfonic acid, Oxidizing agents

Chlorine

with

Iron

Violent polymerization may be caused by:

aluminum chloride, sodium

Risk of explosion with:

Strong acids, polymerization initiators, Peroxides

Oxygen

with

heat

Conditions to avoid

Heating.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

Incompatible materials

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no information available

Hazardous decomposition products

no information available

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact

Target Organs

Eyes

Skin

Respiratory system

Central nervous system

Liver

reproductive system

Acute oral toxicity

LD50 rat: 2,650 mg/kg (RTECS)

Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

Acute inhalation toxicity

LC50 rat: 12 mg/l; 4 h (RTECS)

absorption

Symptoms: Possible damages:, Irritation symptoms in the respiratory tract.

Skin irritation

rabbit

Result: Irritations

(IUCLID)

Drying-out effect resulting in rough and chapped skin.

Causes skin irritation.

Dermatitis

Eye irritation

rabbit

Result: Eye irritation

(IUCLID)

Causes serious eye irritation.

Sensitization

Sensitization test: guinea pig

Result: negative

(IUCLID)

Specific target organ systemic toxicity - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ systemic toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

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Carcinogenicity

IARC	Group 2B: Possibly carcinogenic to humans styrene 100-42-5
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
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.
ACGIH	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Further information

After absorption:
Tiredness, Dizziness, Vomiting
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 *Lepomis macrochirus* (Bluegill sunfish): 25 mg/l; 96 h (in soft water) (Lit.)

Toxicity to daphnia and other aquatic invertebrates

EC50 *Daphnia magna* (Water flea): 4.7 mg/l; 48 h (Lit.)

EC5 *E.sulcatum*: > 256 mg/l; 72 h (Lit.)

Toxicity to algae

IC5 *M.aeruginosa*: 67 mg/l; 8 d (Lit.)

IC50 *Pseudokirchneriella subcapitata* (green algae): 0.72 mg/l; 96 h (Lit.)

Toxicity to bacteria

microtox test EC50 *Photobacterium phosphoreum*: 5.5 mg/l; 5 min (Lit.)

EC5 *Pseudomonas putida*: 72 mg/l; 16 h (Lit.)

Persistence and degradability

Biodegradability

80 %; 20 d

OECD Test Guideline 301D

(IUCLID)

Readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 2.96

OECD Test Guideline 107

Bioaccumulation is not expected (log Pow <1).

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Mobility in soil

No information available.

Other adverse effects

Henry constant

195 Pa·m³/mol

(Lit.) Distribution preferentially in air.

Stability in water

237 d

reaction with hydroxyl radicals (experimental)

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number	UN 2055
Proper shipping name	STYRENE MONOMER, STABILIZED
Class	3
Packing group	III
Environmentally hazardous	--

Air transport (IATA)

UN number	UN 2055
Proper shipping name	STYRENE MONOMER, STABILIZED
Class	3
Packing group	III
Environmentally hazardous	--
Special precautions for user	no

Sea transport (IMDG)

UN number	UN 2055
Proper shipping name	STYRENE MONOMER, STABILIZED
Class	3
Packing group	III
Environmentally hazardous	--
Special precautions for user	yes
EmS	F-E S-D

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SECTION 15. Regulatory information

United States of America

OSHA Hazards

Flammable Liquid
Skin irritant
Eye irritant
Carcinogen
Target organ effects

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

SARA 311/312 Hazards

Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 313

The following components are subject to reporting levels established by SARA Title III, Section 313:

Ingredients

styrene	100-42-5
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SARA 302

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Ingredients

styrene

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Ingredients

styrene

DEA List I

Not listed

DEA List II

Not listed

Massachusetts Right To Know

Ingredients

styrene

Pennsylvania Right To Know

Ingredients

styrene

New Jersey Right To Know

Ingredients

styrene

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Notification status

TSCA: On TSCA Inventory

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

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

Full text of H-Statements referred to under sections 2 and 3.

H226	Flammable liquid and vapor.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H400	Very toxic to aquatic life.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Date of issue:03/11/2013

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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