



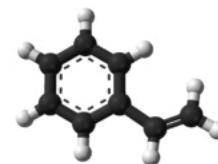
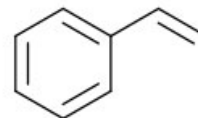
## STYRENE MONOMER

Chemical Formula: C<sub>8</sub>H<sub>8</sub>

CAS Registry Number: 100-42-5

Molecular Weight: 104.15

### PRODUCT INFORMATION



#### Synonyms:

- Benzene ethenyl
- Benzene, ethenyl-
- Benzene,ethenyl-
- Benzene,ethenyl..
- Cinnamene
- estireno
- Ethenylbenzene
- Fenil etileno
- NSC 62785
- Phenethylene
- Phenylethene
- Phenylethylene
- Stypol 040-0165
- styrene
- Styrene
- STYRENE (MONOMER)
- STYRENE MONOMER
- Styrol
- Styrol
- Styrole
- Styrolene
- Styropol SO
- TTB 7302
- UN 2055
- UN 2055
- VINYL BENZENE,  
PHENYLETHYLENE
- Vinylbenzene
- Vinylbenzene, Phenylethylene
- Vinylbenzol

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## Physical and Chemical Properties

**Appearance:** Colorless to yellow oily liquid.

**Odor:** Penetrating odor.

**Solubility:** Negligible (< 0.1%)

**Density:** 0.9059 @ 20°C

**pH:** No information found.

**% Volatiles by volume @ 21°C (70°F):** 100

**Boiling Point:** 145 - 146°C (293 - 295°F)

**Melting Point:** - 30.6°C (-24°F)

**Vapor Density (Air=1):** 3.6

**Vapor Pressure (mm Hg):** 5 @ 20°C (68°F)

**Evaporation Rate (BuAc=1):** No information found.

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## Stability and Reactivity

### **Stability:**

Stabilized styrene (styrene with polymerization inhibitor). Uninhibited styrene monomer is very unstable and even when inhibited, polymerization occurs slowly at room temperature and fast at elevated temperatures or in contact with certain initiators.

### **Hazardous Decomposition Products:**

Carbon dioxide and carbon monoxide may form when heated to decomposition.

### **Hazardous Polymerization:**

Polymerization may occur under fire conditions or if contaminated.

### **Incompatibilities:**

For Styrene Monomer: Vapor is explosive when exposed to heat or flame; reacts with oxygen above 40C (104F) to form a heat-sensitive explosive peroxide. On exposure to light and air, styrene slowly undergoes polymerization and oxidation with formation of peroxides. Violent polymerization may be initiated by alkali metal-graphite composites, butyllithium, dibenzoyl peroxide, azoisobutyronitrile or di-tert-butyl peroxide. Styrene reacts violently with chlorosulfonic acid, oleum, sulfuric acid, chlorine + iron(II)chloride and can react vigorously with oxidizing materials. Dissolves rubber. Corrosive to copper and copper alloys. Incompatible with peroxides, aluminum chloride, strong acids, metallic salts, halogens, polymerization catalysts and accelerators.

### **Conditions to Avoid:**

Heat, flame, ignition sources, air, light and incompatibles.

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## Hazards Identification

### **Emergency Overview**

**DANGER! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND REPRODUCTIVE SYSTEM.**

Health Rating: 3 - Severe (Cancer Causing)

Flammability Rating: 2 - Moderate

Reactivity Rating: 2 - Moderate

Contact Rating: 2 - Moderate (Life)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B



EXTINGUISHER

Storage Color Code: Red (Flammable)

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## **Potential Health Effects**

### **Inhalation:**

Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. A central nervous system depressant. Higher exposures can cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency.

### **Ingestion:**

May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. May cause central nervous system depression. Symptoms may include lethargy, drowsiness, staggering and sleepiness. May cause possible convulsions and risk of pulmonary edema.

### **Skin Contact:**

Causes irritation to skin. Symptoms include redness, itching, and pain. May produce blisters. May be absorbed through the skin.

### **Eye Contact:**

May cause irritation, redness, pain, and corneal damage.

### **Chronic Exposure:**

Repeated exposure may cause nausea, vomiting, appetite loss, a sensation of drunkenness, general weakness, and functional disorders of the nervous system and liver. May cause dermatitis. Women may experience ovulation and menstrual disorders. May cause mutagenic and teratogenic effects.

### **Aggravation of Pre-existing Conditions:**

Persons with pre-existing skin disorders, eye problems, liver disease, central nervous system disorders, or impaired respiratory function may be more susceptible to the effects of the substance.

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## **First Aid Measures**

### **Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

### **Ingestion:**

Do NOT induce vomiting. Give large amounts of water. Never give anything by mouth to an unconscious person. Get medical attention.

### **Skin Contact:**

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

### **Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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## **Fire Fighting Measures**

### **Fire:**

Flash point: 31°C (88°F) CC

Autoignition temperature: 490°C (914°F)

Flammable limits in air % by volume:

l<sub>el</sub>: 0.9; u<sub>el</sub>: 6.8

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Flammable Liquid and Vapor! May accumulate static electricity. Contact with strong oxidizers may cause fire.

**Explosion:**

Sealed containers may rupture when heated. Above the flash point, explosive vapor-air mixtures may be formed. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.

**Fire Extinguishing Media:**

Water spray, dry chemical, alcohol foam, or carbon dioxide. Material floats on water and may travel back to an ignition source and spread fire. Water spray may be used to keep fire exposed containers cool. Do not allow water runoff to enter sewers or waterways.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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## **Accidental Release Measures**

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures.

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## **Handling and Storage**

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. This material is corrosive to copper and copper alloys. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do Not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

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## **Exposure Controls/Personal Protection**

**Airborne Exposure Limits:**

Styrene, monomer:

- OSHA Permissible Exposure Limit (PEL) -

100 ppm (TWA), 200 ppm (Ceiling),

600 ppm (Max. Conc.: 5-minute max. peak in any 3 hours)

- ACGIH Threshold Limit Value (TLV) -

20 ppm (TWA), 40 ppm (STEL), A4 - not classifiable as a human carcinogen.

**Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH



document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**

If the exposure limit is exceeded, a half-face organic vapor respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

**Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Eye Protection:**

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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## Ecological Information

**Environmental Fate:**

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to quickly evaporate. When released into water, this material is expected to readily biodegrade. When released to water, this material is expected to quickly evaporate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day.

**Environmental Toxicity:**

The LC50/96-hour values for fish are between 1 and 10 mg/l.

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## Other Information

**NFPA Ratings:** Health: 2 Flammability: 3 Reactivity: 2

**Label Hazard Warning:**

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**Label Precautions:**

Keep away from heat, sparks and flame.  
Keep container closed.  
Use only with adequate ventilation.  
Avoid contact with eyes, skin and clothing.  
Wash thoroughly after handling.  
Avoid breathing vapor or mist.

**Label First Aid:**

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.