



Safety Data Sheet

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Styrene, monomer

SDS No. : 7405E-2

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

Research and Development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.

Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN

Division: Chemical Safety Management Department

Telephone number: +81-6-6946-8061

FAX: +81-6-6946-1607

Section 2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

PHYSICAL AND CHEMICAL HAZARDS

Flammable liquids: Category 3

Self-reactive substances and mixtures: Type G

HEALTH HAZARDS

Acute toxicity (Inhalation): Category 4

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 2A

Germ cell mutagenicity: Category 2

Carcinogenicity: Category 1B

Reproductive toxicity: Category 1B

Specific target organ toxicity – single exposure: Category 1 (central nervous system)

Specific target organ toxicity – single exposure: Category 3 (Respiratory tract irritation)

Specific target organ toxicity – single exposure: Category 3 (Narcotic effects)

Specific target organ toxicity – repeated exposure: Category 1 (auditory organ, liver, central nervous system, peripheral nervous system, organ of vision, respiratory system)

Aspiration hazard: Category 1

ENVIRONMENT HAZARDS

Hazardous to the aquatic environment, short-term (acute): Category 1

Hazardous to the aquatic environment, long-term (chronic): Category 2

(Note) GHS classification without description: Not classified/Classification not possible

Label elements



Signal word: Danger

HAZARD STATEMENT

Flammable liquid and vapor

Harmful if inhaled

Causes skin irritation

Causes serious eye irritation

Suspected of causing genetic defects



May cause cancer
May damage fertility or the unborn child
Causes damage to organs (central nervous system)
May cause respiratory irritation
May cause drowsiness or dizziness
Causes damage to organs through prolonged or repeated exposure (auditory organ, liver, central nervous system, peripheral nervous system, organ of vision, respiratory system)
May be fatal if swallowed and enters airways
Very toxic to aquatic life
Toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENT**Prevention**

Avoid release to the environment.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.
Ground and bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use non-sparking tools.
Take action to prevent static discharges.
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wash contaminated parts thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not eat, drink or smoke when using this product.

Response

In case of fire: Use appropriate media to extinguish.
Collect spillage.
Get medical advice/attention if you feel unwell.
IF EXPOSED OR CONCERNED: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF ON SKIN: Wash with plenty of soap and water.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
If skin irritation occurs: Get medical advice/attention.
Take off contaminated clothing and wash it before reuse.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage

Store in a well-ventilated place. Keep container tightly closed. Keep cool.

Disposal

Dispose of contents/container in accordance with local/national regulation.

Specific Physical and Chemical hazards

Flammable liquid. Vapor/air mixture may explode.



Section 3. Composition/information on ingredients

Mixture/Substance selection:

Substance

Ingredient name: Styrene

Content (%): 99(min)

Chemical formula: C₈H₈

Chemicals No, Japan: 3-4

CAS No.: 100-42-5

MW: 104.15

ECNO: 202-851-5

Note: The figures shown above are not the specifications of the product.

Stabilizing additives

4-tert-Butylcatechol(p-) 0.0027-0.0033% (CAS No. 98-29-3)

Section 4. First-aid measures

Descriptions of first-aid measures

General measures

Get medical advice/attention if you feel unwell.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER/doctor/physician if you feel unwell.

IF ON SKIN (or hair)

Take off immediately all contaminated clothing. Rinse skin with water or shower.

Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical advice/attention.

IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF SWALLOWED

Rinse mouth.

Do NOT induce vomiting.

Immediately call a POISON CENTER/doctor/physician.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use foam, dry powder, CO₂ to extinguish.

Unsuitable extinguishing media

Indoor firefighting equipment or outdoor firefighting equipment

Sprinkler equipment

Dry-powder firefighting equipment – other (except for phosphate etc., hydrogen carbonate etc.)

Straight stream water extinguisher

Water mist extinguisher

Reinforcing liquid jet extinguisher

Dry-powder extinguisher – other (except for phosphate etc., hydrogen carbonate etc.)

Bucket of water or tank of water

Specific hazards arising from the substance or mixture

Containers may explode when heated.

Fire may produce irritating, corrosive and/or toxic gases.

**Advice for firefighters****Specific fire-fighting measures**

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire resistant or flame retardant clothing.

Wear protective gloves/protective clothing/eye protection/face protection.

Firefighters should wear self-contained breathing apparatus with full face piece operated positive pressure mode.

Section 6. Accidental release measures**Personnel precautions, protective equipment and emergency procedures**

Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses or low areas.

Methods and materials for containment and cleaning up

Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.

Preventive measures for secondary accident

Collect spillage.

Section 7. Handling and storage**Precautions for safe handling****Preventive measures**

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Ground and bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment.

Use non-sparking tools.

Take action to prevent static discharges.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

Safety Measures

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

When using do not eat, drink or smoke.

Any incompatibilities

See "10.Stability and Reactivity"

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Do not eat, drink or smoke when using this product.

Take off contaminated clothing and wash it before reuse.

Storage**Conditions for safe storage**

Keep container tightly closed.

Store in a cool, dry place. Do not store in direct sunlight.



Container and packaging materials for safe handling

Glass

Stainless steel

Section 8. Exposure controls/personal protection

Control parameters

Adopted value

(Styrene)

ACGIH(2020) TWA: 10ppm;

STEL: 20ppm (CNS & hearing impair; URT irr; peripheral neuropathy; visual disorders)

Notation

(Styrene)

OTO

OSHA-PEL

(Styrene)

TWA: 100ppm; STEL: C 200ppm

Acceptable maximum peak: 600ppm; Maximum Duration: 5min in any 3 hr

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures

Respiratory protection

Wear respiratory protection.

Hand protection

Wear protective gloves.

Eye protection

Wear eye/face protection.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid

Color: Colorless, clear to yellow

Odor: Characteristic odor

Melting point/Freezing point: -30.6°C

Boiling point or initial boiling point: (Styrene)145°C

Boiling range data is not available.

Flammability (gases, liquids and solids) data is not available.

Lower and upper explosion limit/flammability limit:

Lower explosion limit: 0.9 vol %

Upper explosion limit: 6.8 vol %

Flash point: (Styrene)31°C

Auto-ignition temperature: (Styrene)490°C

Decomposition temperature data is not available.

pH data is not available.

Dynamic viscosity: 0.696mPas(25°C)

Kinematic viscosity: 0.77mm²/s(25°C)

Solubility:

Solubility in water: 0.03 g/100 ml (20°C)

n-Octanol/water partition coefficient: log Pow3



Vapor pressure: 0.67 kPa (20°C)

Density and/or relative density: 0.91

Relative vapor density (Air=1): 3.6

Relative density of the Vapor/air – mixture at 20°C (Air = 1): 1.02

Particle characteristics data is not available.

Section 10. Stability and Reactivity

Reactivity

Not available.

Chemical stability

Polymerize by heat.

Possibility of hazardous reactions

The substance can form explosive peroxides. The substance may polymerize due to warming, under the influence of light, oxidants, oxygen and peroxides. This generates fire and explosion hazard. Reacts violently with strong acids and strong oxidants. This generates fire and explosion hazard. Attacks rubber, copper and copper alloys. (ICSC 0073)

Conditions to avoid

Contact with incompatible materials.

Contact with fire source.

Incompatible materials

Strong acids, Strong oxidizing agents

Hazardous decomposition products

Carbon oxides, Explosive peroxides

Section 11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[Data for components of the product]

[GHS Cat. Japan, base data]

(Styrene)

rat LD50=2650mg/kg (MOE Result of the initial environmental risk assessment of chemicals, Vol.13, 2015)

(4-tert-Butylcatechol(p-))

rat LD50=2820mg/kg (NTP TOX-70, 2002)

Acute toxicity (Dermal)

[Data for components of the product]

[GHS Cat. Japan, base data]

(4-tert-Butylcatechol(p-))

rabbit LD50=630mg/kg (NTP TOX-70, 2002)

Acute toxicity (Inhalation)

[Data for components of the product]

[GHS Cat. Japan, base data]

(Styrene)

vapor: rat LC50=2770ppm/4hr (ACGIH 7th, 2020) < 90% of saturated vapor press. conc. (8422ppm)

Irritant properties

Skin corrosion/irritation

[Data for components of the product]

[GHS Cat. Japan, base data]

(Styrene)

irritation (MOE risk assessment vol.13, 2015; HSDB, Access on August 2020) et al.



Serious eye damage/irritation

[Data for components of the product]

[GHS Cat. Japan, base data]

(Styrene)

irritation (MOE risk assessment vol.13, 2015) et al.

Allergenic and sensitizing effects data is not available.

Germ cell mutagenicity

[Data for components of the product]

[GHS Cat. Japan, base data]

(Styrene)

cat. 2; ATSDR, 2010 et al.

Carcinogenicity

[Data for components of the product]

[GHS Cat. Japan, base data]

(Styrene)

cat.1B; IARC Gr. 2A (IARC 121, 2019)

[IARC]

(Styrene)

Group 2A : Probably carcinogenic to humans

[ACGIH]

(Styrene)

A3(2020) : Confirmed Animal Carcinogen with Unknown Relevance to Humans

Reproductive toxicity

[Data for components of the product]

[GHS Cat. Japan, base data]

(Styrene)

cat. 1B; OEL Documentations (JSOH), 2015 et al.

Specific target organ toxicity (STOT)

STOT-single exposure

[Data for components of the product]

[cat.1]

[GHS Cat. Japan, base data]

(Styrene)

central nervous system (ACGIH 7th, 2020)

[cat.3 (respiratory tract irritation)]

[GHS Cat. Japan, base data]

(Styrene)

respiratory tract irritation (MOE Result of the initial environmental risk assessment of chemicals vol. 13, 2015)

[cat.3 (narcotic effects)]

[GHS Cat. Japan, base data]

(Styrene)

narcotic effect (MOE Result of the initial environmental risk assessment of chemicals vol. 13, 2015)

STOT-repeated exposure

[Data for components of the product]

[cat.1]

[GHS Cat. Japan, base data]

(Styrene)

auditory organ, liver, central nervous system, peripheral nervous system, organ of vision, respiratory system (ACGIH 7th, 2020)

Aspiration hazard

[Data for components of the product]

[cat.1]



[GHS Cat. Japan, base data]

(Styrene)

cat. 1; hydrocarbon, kinematic viscosity = 0.772 mm²/s (25°C)

Section 12. Ecological Information

Toxicity

Aquatic toxicity

[Data for components of the product]

Hazardous to the aquatic environment, short-term (acute)

[GHS Cat. Japan, base data]

(Styrene)

Algae (*Pseudokirchneriella subcapitata*) EC₅₀=0.72mg/L/96hr (MOE Japan, 2015)

Hazardous to the aquatic environment, long-term (chronic)

[GHS Cat. Japan, base data]

(Styrene)

Algae (*Pseudokirchneriella subcapitata*) NOEC=0.063mg/L/96hr (MOE Japan, 2015)

Water solubility

(Styrene)

0.03 g/100 ml (20°C) (ICSC, 2006)

Persistence and degradability

[Data for components of the product]

(Styrene)

Rapidly degradable (BOD_Degradation : 100%/14 days; GC_Degradation: 100%/14 days (MITI official bulletin))

Bioaccumulative potential

[Data for components of the product]

(Styrene)

log K_{ow}=2.95 (PHYSPROP DB, 2009)

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Avoid release to the environment.

Dispose of contents/container in accordance with local/national regulation.

Section 14. Transport Information

UN Number or ID Number : 2055

UN Proper Shipping Name :

STYRENE MONOMER, STABILIZED

Class or division (Transport hazard class) : 3

Packing group : III

ERG GUIDE No.: 128P

Special provisions No.: 386

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 2055

UN Proper Shipping Name :

**STYRENE MONOMER, STABILIZED**

Class or division (Transport hazard class) : 3

Packing group : III

Special provisions No.: 386

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 2055

UN Proper Shipping Name :

STYRENE MONOMER, STABILIZED

Class or division (Transport hazard class) : 3

Hazard labels : Flamm.liquid

Packing group : III

Special provisions No.: A209

Environmental hazards

Marine pollutants (yes/no) : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Noxious Liquid Substances ; Cat. Y

Styrene

Flammable Liquid

Styrene

Section 15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

4-tert-Butylcatechol(p-); Styrene

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

Section 16. Other information**GHS classification and labelling**

Flammable liquids, Category 3: H226 Flammable liquid and vapour

Self-Reactive Substances and Mixtures, Type G

Acute toxicity, Category 4: H332 Harmful if inhaled

Skin corrosion/irritation, Category 2: H315 Causes skin irritation

Serious eye damage/eye irritation, Category 2A: H319 Causes serious eye irritation

Germ cell mutagenicity, Category 2: H341 Suspected of causing genetic defects

Carcinogenicity, Category 1B: H350 May cause cancer

Reproductive toxicity, Category 1B H360 May damage fertility or the unborn child

STOT – single exposure, Category 1: H370 Causes damage to organs

STOT – single exposure, Category 3, Respiratory tract irritation: H335 May cause respiratory irritation.

STOT – single exposure, Category 3, Narcotic effects: H336 May cause drowsiness or dizziness.

STOT – Repeated exposure, Category 1: H372 Causes damage to organs through prolonged or repeated exposure

Aspiration hazard, Category 1: H304 May be fatal if swallowed and enters airways

Hazardous to the aquatic environment, short-term (acute), Category 1: H400 Very toxic to aquatic life

Hazardous to the aquatic environment, long-term (chronic), Category 2: H411 Toxic to aquatic life with long lasting effects

References and sources for data



Globally Harmonized System of classification and labelling of chemicals, UN
Recommendations on the TRANSPORT OF DANGEROUS GOODS 21th edit., 2019 UN
IMDG Code, 2020 Edition (Incorporating Amendment 40-20)
IATA Dangerous Goods Regulations (62nd Edition) 2021
2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2022 TLVs and BEIs. (ACGIH)
Supplier's data/information

General Disclaimer

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2021).