บริษัท โมเดอนเคมีเคิล จำกัด (สำนักงานใหญ่) (MODERN CHEMICAL CO.,LTD. (Head Office)
82/80 ซอยเอกมัย 22(นวลน้อย) ถ.สุขุมวิท 63 แขวงคลองตันเหนือ เขตวัฒนา กรุงเทพมหานคร 10110 โทร.0-2715-0897-9 แฟกซ์.0-2392-3410-3
82/80 Soi Eakmai 22(nuan-noi) 63 Sukhumvit Rd, North Klong Ton, Wattana, Bangkok 10110 E-mail: service@modernchemical.co.th

SAFETY DATA SHEET

STYRENE MONOMER

1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

Product name:	STYRENE MONOMER
Recommended use:	Chemical for industrial
Manufacturer/Supplier:	**MODERN CHEMICAL CO.,LTD.**
	82/80 Soi Ekamai 22 (Nuannoi), Sukhumvit 63,
	Klong Tan Nuea, Watthana, Bangkok 10110
Telephone No:	0-2715-0897-9, 0-2392-3410-3
Fax No:	0-2715-0908-9, 0-2391-1571-2
Emergency Telephone No:	0-2715-0897-9, 0-2392-3410-3

2. HAZARDS IDENTIFICATION

Label elements

Pictogram

Signal word Danger

Hazard statement(s):

1.) Flammable liquid and vapour.

2.) Harmful if inhaled.

3.) Causes skin irritation.

4.) Causes serious eye irritation.

5.) May cause respiratory irritation.

6.) Causes damage to organs through prolonged or repeated exposure.

7.) May be fatal if swallowed and enters airways.

Precautionary statement(s):

1.) Keep away from heat/sparks/open flames/hot surfaces.- No smoking.

2.) Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

3.) Wear protective gloves/ eye protection/ face protection.

4.) In case of fire: Use water fog or fine spray, foam, carbon dioxide fire extinguishers, or dry chemical fire extinguishers for extinction.

5.) IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

6.) IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

7.) IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

8.) Store in a well-ventilated place. Keep container tightly closed. Store locked up.

9.) Dispose of contents and container to licensed, permitted incinerator, or other thermal destruction device.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonym: N/A

Ingredients	% (w/w)	CAS NO.
STYRENE MONOMER	100	100-42-5

4. FIRST AID MEASURES

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Wash skin with plenty of water.

Eye contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable Extinguishing Media:

Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.

Specific hazards arising from Chemicals:

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may rupture from polymerization. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9. Dense smoke is produced when product burns.

Special protective equipment for fire-fighters:

Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Precautions: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Refer to Section 7, Handling, for additional precautionary measures. For large spills, warn public of downwind explosion

hazard. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and Material for Containment and Clean Up:

Contain spilled material if possible. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for Safe Handling & Product Transfer:

Keep away from heat, sparks and flame. Use only with adequate ventilation. Keep container closed. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor. Do not swallow. Wash thoroughly after handling. No smoking, open flames or sources of ignition in handling and storage area. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Never use air pressure for transferring product. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. This product is a poor conductor of electricity and can become electrostatically charged, even in bonded or grounded equipment. If sufficient charge is accumulated, ignition of flammable mixtures can occur. Handling operations that can promote accumulation of static charges include but are not limited to mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank

cleaning, sampling, gauging, switch loading, vacuum truck operations. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for Safe Storage & Unsuitable Materials:

Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Maintain inhibitor and dissolved oxygen level. Do not purge containers of this material with nitrogen. Recommended oxygen level is: 10-15 ppm O2 minimum. Recommended inhibitor level is: 10 to 20 ppm. See Section 10 for more specific information. Prevent formation of explosive mixtures by either maintaining temperature below 29°C (84°F) or by padding with nitrogen/oxygen mixture with a ratio of 95%/5% to 92%/8% nitrogen/oxygen.

Storage Period: 24 Months **Storage temperature:** < 30 °C

Storage Period: 24 Months **Maximum storage temperature:** 30 °C

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: TWA 20-100 ppm, STEL 40-200 ppm

Appropriate Engineering Controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Individual Protection Measures

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply. The following should be effective types of airpurifying respirators: Organic vapor cartridge.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove

barrier materials include: Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). Styrene/butadiene rubber. Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR").

Eye protection: Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin and body protections: When prolonged or frequently repeated contact could occur, use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, boots, apron, or full-body suit will depend on the task.

Hygiene measure: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form, Color and Odor : liquid, colorless, sweet odor	**Evaporation rate :** N/A
Melting Point : -30.6 °C	**Specific gravity :** 0.906 at 20 °C
pH : N/A	**Solubility in water :** 0.032 % at 25 °C
Boiling point : 145 °C	**Viscosity :** <= 0.73 mPa.s (Dynamic)
Vapour pressure : 6.62 hPa at 20 °C	**Vapour density :** 3.6 (Air = 1)
Lower explosive limits: 0.9 %Vol	**Upper explosive limits:** 6.8 %Vol
Auto-ignition temperature: 470 °C	**Flash Point:** 31 °C
Odour threshold: N/A	**Flammability (solid, gas):** N/A
Decomposition temperature: N/A	**Solubility in other solvents:** N/A
n-octanol/water partition coefficient (log P_{ow}): 2.95	

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under recommended storage conditions. See Storage, Section 7.

Reactions: No dangerous reaction known under conditions of normal use.

Possibility of Hazardous Reactions: Can occur. Maintain inhibitor and dissolved oxygen level. Do not purge containers of this material with nitrogen. Polymerization can be catalyzed by: Absence of air. Metal salts. Peroxides. Rust. This product is inhibited with: p-Tertiary butylcatechol. Uninhibited monomer vapors can polymerize and plug relief devices.

Conditions to avoid: Avoid temperatures above 30 °C (86 °F) Exposure to elevated temperatures can cause product to decompose. Avoid static discharge. Do not blanket or purge with an inert gas to avoid depleting the oxygen concentration. Avoid direct sunlight.

Materials to avoid: Avoid contact with oxidizing materials. Avoid contact with: Acids. Caustic potash. Caustic soda. Metal halides. Avoid contact with absorbent materials such as: Cellulose. Clay-based absorbents. Sawdust. Avoid unintended contact with peroxides.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials.

11. TOXICOLOGICAL INFORMATION

Acute toxicity: LD50 (Oral, rat): 5000 mg/kg

LC50 (Inhalation, rat): 11.8 mg/l-4h

LD50 (Skin, rat): 1331 mg/l

Sensitization: Ingestion: Very low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Swallowing may result in irritation of the mouth, throat, and gastrointestinal tract.

Aspiration hazard: Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.

Skin: Prolonged contact may cause skin irritation with local redness. Repeated contact may cause skin burns. Symptoms may include pain,

severe local redness, swelling, and tissue damage. May cause drying and flaking of the skin.

Inhalation: Vapor concentrations are attainable which could be hazardous on single exposure. Excessive exposure may cause irritation to upper respiratory tract (nose and throat). Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

Eye: May cause moderate eye irritation. May cause moderate corneal injury. Vapor may cause eye irritation experienced as mild discomfort and redness. Vapor may cause lacrimation (tears).

Chronic toxicity: An increased incidence of lung tumors was observed in mice from an inhalation study on styrene. The relevance of this finding to humans is uncertain since data from mode of action investigations of mouse lung tumors coupled with other long-term animal studies and epidemiology studies of worker exposed to styrene do not provide a basis to conclude that styrene is carcinogenic.

Carcinogenicity Classifications: IARC-Possibly carcinogenic to humans.; 2B

Further toxicological information: No data available**.**

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish: LC50 - Oncorhynchus mykiss (rainbow trout): 4.1 mg/l -96 h

Toxicity to daphnia and other aquatic invertebrates:

LC50 - Daphnia magna (Water flea): 23 mg/l -48 h

EC50 - Daphnia magna (Water flea): 4.7 mg/l -48 h

Toxicity to algae: ErC50 - Pseudokirchneriella subcapitata (green algae): 4.9 mg/l -72 h

Toxicity to bacteria: LC50 - Eisenia fetida (earthworms): 120 mg/kg -14 d

Biodegradability Remarks: Material is ultimately biodegradable (reaches > 70% biodegradation in OECD test(s) for inherent biodegradability). Biodegradation under

	aerobic static laboratory conditions is high . Material is expected to be readily biodegradable.
Bioaccumulative Potential:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Mobility:	Potential for mobility in soil is low.
Affected in any other way:	This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Material Disposal: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Container Disposal: No data available**.**

14. TRANSPORT INFORMATION

ROAD & RAIL

UN-No: 2055 Class: 3 Packing group: III

Proper shipping name: STYRENE MONOMER, STABILIZED

IMDG

UN-No: 2055 Class: 3 Packing group: III

EMS-No: F-E, S-D Marine pollutant: No

Proper shipping name: STYRENE MONOMER, STABILIZED

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

Product Name: STYRENE MONOMER

Ship Type: 3

Pollution Category: Y

ICAO/IATA

UN-No: 2055 Class: 3 Packing group: III

Proper shipping name: STYRENE MONOMER, STABILIZED

Cargo Packing Instruction: 366

Passenger Packing Instruction: 355

15. REGULATORY INFORMATION

Thailand: Hazardous Substance Act, B.E. 2535

A component(s) of this product is classified according to Thai Hazardous Substance Acts- type 2.

Thailand: Notification of Department of Labour Protection and Welfare (List of Hazardous Chemicals)

One or more components of this product are listed.

Thailand: Munitions Control Act B.E.2530

All components of this product are not listed.

16. OTHER INFORMATION

Modern Chemical Co.,Ltd. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

MODERN CHEMICAL CO., LTD. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE

INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MODERN CHEMICAL CO.,LTD. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.