



Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name	alpha-Methyl Styrene
Synonyms	1-methyl-1-phenylethylene; 2-phenylpropene; 2-phenylpropylene; isopropenylbenzene; α -methyl styrene
CAS#	98-83-9
Europe EU#	202-705-0
Product Uses	monomer for manufacture of styrene polymers

2. HAZARDS

Quick Guide: combustible liquid, heavy vapour may travel, distant ignition and flashback are possible, irritating to skin and very irritating to eyes, suspected teratogen (*on ingestion only*)

Canada – WHMIS

Key:

B 3, D 2B

B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C

D 1 – Immediately Toxic, D 2 – Chronic Toxicity

C – Oxidising Substance, E – Corrosive, F – Reactive Substance



U.S.A. – HMIS

Key:

Health – 3, Fire – 2, Reactivity – 0

0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

3. COMPOSITION

	%	TWAEV / TLV mg/m ³	LD ₅₀ (mg/kg) ORAL	LD ₅₀ (mg/kg) SKIN	LC ₅₀ ppm INHALATION
1-methyl-1-phenylethylene	100%	50 / 242	4500	14,500	>3000

4. FIRST AID

SKIN:	Wash with soap & plenty of water. Remove contaminated clothing and do not reuse until thoroughly cleaned or laundered.
EYES:	Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
INHALATION:	Remove from contaminated area promptly. CAUTION: Rescuer must not endanger himself! If breathing stops, administer artificial respiration and seek medical aid promptly.
INGESTION:	Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

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5. FIRE FIGHTING & FLAMMABILITY

Flash Point	58°C / 136°F (closed cup)
Autoignition Temperature	573°C / 1065°F
Flammable Limits	0.8% – 11%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Firefighting Precautions	foam, dry chemical, water fog, water spray only to cool & dilute, product floats on water – water jet spreads flames; firefighters must wear SCBA
Static Charge Accumulation	not known – may accumulate a static charge on agitation or pumping

6. ACCIDENTAL RELEASE MEASURES

Leak Precaution	dyke to control spillage and prevent environmental contamination
Handling Spill	ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep, shovel & store in closed containers for recycling or disposal

7. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat and oxidising agents. It is prudent to use non-sparking bronze or aluminium hand tools, and to ensure that electrical & mechanical equipment (including lighting, switchgear & forklift trucks) used with or around this product are explosion-proof.

This product may retain a static charge on agitation or transfer from one container to another. Its flash point is high enough to be reasonably safe, but we recommend that you always ground or electrically bond both the source container, the receiving container, and transfer pump before transferring contents. Avoid splashing by ensuring that the product nozzle is below the surface in the receiving container.

This product may react with oxygen in the air to form explosive or flammable peroxides on prolonged storage – *which should be avoided*. The polymerisation inhibitor (*tert*-butyl catechol) requires at 5-10% oxygen to be effective. Empty containers may contain a flammable or explosive vapour. Always ensure that containers, whether empty or full, are tightly closed unless in use.

Avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with an organic vapour cartridge.

Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	50ppm / 241mg/m ³	Ontario STEV	100ppm / 482mg/m ³
ACGIH TLV	10ppm / 48mg/m ³		
OSHA PEL	50ppm / 240mg/m ³	OSHA PEL-C	100ppm / 480mg/m ³
Ventilation	mechanical ventilation may be required to control airborne titre below regulated limits		
Hands	nitrile or “Viton” gloves recommended – <i>other types may also protect; consult supplier to confirm suitability</i>		
Eyes	safety glasses with side shields – <i>always protect the eyes</i>		
Clothing	wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing,		

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9. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless liquid with characteristic sharp, sweetish penetrating odour
Odour Threshold	0.05-0.1ppm
Vapour Pressure	2.3mmHg / 0.31kPa (20°C / 68°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	not known – <i>similar to mineral spirits</i>
Vapour Density (air = 1)	4.1
Boiling Range	165°C / 329°F
Freezing Point	-23°C / -10°F
Specific Gravity	0.908 (25/25°C)
Water Solubility	not known – below 1g/litre
Also soluble in	most organic solvents, particularly aromatic hydrocarbons
Viscosity	0.94centipoise (20°C / 68°F)
pH	none – (<i>does not liberate hydrogen ions when dissolved</i>)
Conversion Factor	1ppm = 4.82mg/m ³
Molecular Weight	118grams per mole

10. REACTIVITY

Dangerously Reactive With	strong oxidising agents, halogens
Also Reactive With	aluminium, iron chloride, copper (<i>may initiate hazardous polymerisation</i>)
Stability	stable in the presence of polymerisation inhibitors
Decomposes in Presence of	heat; absence of inhibitor (<i>eg: tert-butyl catechol</i>)
Decomposition Products	dangerous peroxides may form on prolonged storage
Sensitive to Mechanical Impact	no

11. TOXICITY**Effects, Acute Exposure**

Skin Contact	may irritate, but mild irritant on short exposure
Skin Absorption	slight; no toxic effects likely by this route
Eye Contact	liquid may irritate; vapour irritating – lachrymator (<i>causes tears</i>)
Inhalation	may irritate but low vapour pressure makes this action unlikely
Ingestion	not known – not a route of industrial exposure

Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis, local oedema; may damage liver & kidneys
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect in humans; experimental teratogen in rodents <u>on ingestion</u> (<i>not a route of industrial exposure</i>)
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD ₅₀ (oral)	4900mg/kg (rat), 4500mg/kg (mouse),
LD ₅₀ (skin)	14,500mg/kg (rabbit)
LC ₅₀ (inhalation)	above 3000ppm (rat & guinea pig))

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12. ECOLOGICAL INFORMATION

Bioaccumulation	not a bioaccumulator
Biodegradation	biodegrades slowly, however certain microorganisms are able to degrade it
Abiotic Degradation	reacts rapidly with atmospheric hydroxyl radicals; estimated ½-life in air is 7hours or even faster
Mobility in soil, water	water insoluble; moves very slowly in soil & water

Aquatic Toxicity

LC ₅₀ (Fish)	28mg/litre (Leuciscus idus, 48hr)
NOEC (Fish)	5mg/litre (Salmo gairdneri, 24hr)
EC ₅₀ (Crustacea, 48hr)	4.2mg/litre (Chaetogammarus marinus, 48hr)
EC ₅₀ (Algae)	no data
EC ₁₀ (Bacteria)	283mg/litre (Pseudomonas putida)

13. DISPOSAL

Waste Disposal	do not flush to sewer , incinerate in approved facility with flue gas monitoring & scrubbing
Containers	Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

14. TRANSPORT CLASSIFICATION

Canada TDG	PIN	UN - 2303
AND	Shipping Name	isopropenylbenzene
U.S.A. 49 CFR	Class & Packing Group	3 (III)
Marine Pollutant		not a marine pollutant
ERAP Required		NO

EMERGENCY INFORMATION

Canada	Call CANUTEC (collect)	(613) 996-6666
U.S.A.	Call CHEMTREC	(800) 424-9300

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory
Europe Classification	Dangerous for the Environment Harmful – Irritating
Europe Risk phrases	R: 10, 36/37, 51/53 – <i>Flammable. Irritating to eyes & respiratory system. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</i>
Europe Safety Phrases	S: 61 – <i>Avoid release to the environment. Refer to special instructions/safety data sheet.</i>

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15. REGULATIONS, USA, cont'd

USA Regulations:

Immediately Dangerous to Life or Health: 700 ppm

OSHA Standards: Permissible Exposure Limit: Table Z-1 Ceiling value: 100 ppm (480 mg/cu m).

NIOSH Recommendations: Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 50 ppm (240 mg/cu m). Recommended Exposure Limit: 15 Min Short-Term Exposure Limit: 100 ppm (485 mg/cu m).

Threshold Limit Values: 8 hr Time-Weighted Avg (TWA): 50 ppm; 15 min Short Term Exposure Limit (STEL): 100 ppm. 2008 Notice of Intended Changes: These substances, with their corresponding values and notations, comprise those for which (1) a limit is proposed for the first time, (2) a change in the Adopted value is proposed, (3) retention as an NIC is proposed, or (4) withdrawal of the Documentation and adopted TLV is proposed. In each case, the proposals should be considered trial values during the period they are on the NIC. These proposals were ratified by the ACGIH Board of Directors and will remain on the NIC for approximately one year following this ratification. If the Committee neither finds nor receives any substantive data that changes its scientific opinion regarding an NIC TLV, the Committee may then approve its recommendation to the ACGIH Board of Directors for adoption. If the Committee finds or receives substantive data that change its scientific opinion regarding an NIC TLV, the Committee may change its recommendation to the ACGIH Board of Directors for the matter to be either retained on or withdrawn from the NIC. Substance: alpha-Methyl styrene; Time Weighted Avg (TWA): 5 ppm; Short Term Exposure Limit (STEL): None; Notations: A3: Confirmed animal carcinogen with unknown relevance to humans.; Molecular Weight: 118.18; TLV Basis-Critical Effect(s): Cancer; upper respiratory tract irritation; female reproductive damage; body weight effects; liver damage.

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. alpha-Methylstyrene is produced, as an intermediate or a final product, by process units covered under this subpart.

TSCA Requirements: Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. Benzene, (1-methylethyl)- is included on this list.

16. OTHER INFORMATION

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Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.

Preparation Date: January 2004 Revision Date: February 2007, January 2010; February 2013

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