



SAFETY DATA SHEET (SDS)

XYLENE

1. Identification

| | | |
|--------------------------------|---|--|
| SDS Record Number | : | PCS 08006 |
| Date of SDS | : | 10 October 2016 |
| Identity of the substance | : | Xylene |
| Product Description | : | Aromatic hydrocarbon |
| Other names/synonyms | : | Dimethylbenzene, Methyl Toluene, Xylol, Xylenes (IBC code) |
| Name of the supplier | : | Petrochemical Corporation of Singapore (Private) Limited |
| Recommended uses | : | Solvent, diluent, chemical feedstock, or fuel |
| Contact detail of the supplier | : | 100 Ayer Merbau Road, Singapore 628277 |
| | : | +65 68672102 |
| 24-Hour Emergency contact | : | Asia Pacific +65 3158 1074 (Singapore) |
| | : | China +86 10 5100 3039 (Beijing) |
| | : | Europe, Israel & Americas +44 (0) 1235 239 670 (UK) |
| | : | Middle East & Africa +44 (0) 1235 239 671 (UK) |

2. Hazards Identification

GHS Classification

| <u>Hazard Class</u> | <u>Hazard Category</u> |
|--|----------------------------|
| • Flammable Liquid | 3 |
| • Acute Toxicity (Oral) | 5 |
| • Acute Toxicity (Inhalation) | 4 |
| • Skin Corrosion/Irritation | 2 |
| • Serious Eye Damage/ Irritation | 2A |
| • Carcinogenicity | 2 |
| • Toxic to reproduction | 1B |
| • STOST (Single exposure) | 2 (central nervous system) |
| • STOST (Repeated exposure) | 2 (central nervous system) |
| • Aspiration hazard | 1 |
| • Acute hazards to the aquatic environment | 2 |

Pictograms



Signal Word: Danger

Hazard Statements

- Flammable liquid and vapour
- May be harmful if swallowed
- Harmful if inhaled
- Causes skin irritation and serious eye irritation
- Suspected of causing cancer
- May damage fertility or the unborn child
- May cause damage to organs
- May cause damage to organs through prolonged or repeated exposure
- May be fatal if swallowed and enters airways
- Toxic to aquatic life



Precautionary Statements

Prevention

- Keep container tightly closed.
- Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
- Wear protective gloves /protective clothing/eye protection/face protection
- Ground/Bond container and receiving equipment
- Use explosion-proof electrical/ventilating/lighting equipment.
- Take precautionary measures against static discharge.
- Use only non-sparking tools.
- Wash thoroughly after handling.
- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Do not eat, drink or smoke when using this product.
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Avoid release to the environment
- Use only outdoors or in a well-ventilated area.

Response

- IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
- Call a POISON CENTER/doctor/physician if you feel unwell.
- In case of fire: Use appropriate media for extinction.
- If INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- IF ON SKIN: Wash with plenty of soap and water.
- Take of contaminated clothing and wash before re-use.
- If skin irritation 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.
- Wash hands after handling
- IF exposed or concerned: Get medical attention/advice.
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- Do NOT induce vomiting.

Storage

- Store in well-ventilated place. Keep cool.
- Store locked up.

Disposal

- Dispose of the contents in accordance to the local mandatory rules and regulations

3. Composition/Information On Ingredients

Chemical identification : $C_6H_4(CH_3)_2$
Common name(s) / synonym(s) : Dimethylbenzene, Methyl Toluene, Xylol
CAS number / EC number : 1330-20-7/215-535-7

Other substances in product Hazardous to health or environment

| Chemical Identification | Common name | CAS number | Concentration |
|-------------------------|---------------|------------|----------------|
| Ethyl Benzene | Ethyl Benzene | 100-41-4 | 51- 69 wt% |
| m-Xylene | m-Xylene | 108-38-3 | 16 - 26 wt% |
| p-Xylene | p-Xylene | 106-42-3 | 6 - 11 wt% |
| o-Xylene | o-Xylene | 95-47-6 | 7 - 13 wt% |
| Toluene | Toluene | 108-88-3 | 0.01- 0.07 wt% |



4. First-Aid Measures

Eye: Irrigate immediately. If this chemical contacts the eyes, immediately wash (irrigate) the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately.

Skin: Soap wash promptly. If this chemical contacts the skin, promptly flush the contaminated skin with soap and water. If this chemical penetrates the clothing, promptly remove the clothing and flush the skin with water. If irritation persists after washing, get medical attention.

Breathing: Respiratory support. If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.

Swallow: Medical attention immediately. If this chemical has been swallowed, get medical attention immediately. DO NOT induce vomiting. Keep at rest.

5. Fire-Fighting Measures

Extinguishing media

- Use foam or dry chemical to extinguish fire.
- Use water spray to cool fire exposed surfaces and to protect personnel.
- Shut off fuel to fire if possible to do so without hazard. If a leak or spill has not ignited use water spray to disperse the vapours.

Specific Hazards Arising From The Chemical:

- **General Hazards:** Flammable Liquid; may release vapours that form flammable mixtures at or above the flash point. Toxic gases will form upon combustion.
- **Hazardous Combustion Products:** Fumes, smoke, and carbon monoxide.
- This liquid is volatile and gives off invisible vapors.
- Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

Special Protective Equipment And Precautions For Fire Fighters

- Respiratory and eye protection required for fire fighting personnel.
- Avoid spraying water directly into storage containers due to danger of boilover.
- A self-contained breathing apparatus (SCBA) is recommended for indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA is optional.
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6. Accidental Release Measures

- Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
- Prevent spills from entering sewers, watercourses or low areas.
- Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
- Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent.
- Warn occupants and shipping in surrounding and downwind areas of fire and explosion hazard and request all to stay clear. Remove from surface by skimming or with suitable absorbents.
- If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.
- Notify the appropriate authorities immediately.



- Take all additional action necessary to prevent and remedy the adverse effects of the spill.
 - Provide adequate Ventilation.
 - Remove all ignition sources.
 - Collect leaking and spilled liquid in sealable containers as far as possible.
 - Absorb remaining liquid in sand or inert absorbent and remove to safe place.
 - (Extra personal protection: filter respirator for organic gases and vapours.)
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7. Handling And Storage

Precautions for safe handling

- Keep container closed. Handle and open containers with care.
- **Do not** handle or store near an open flame, heat, or other sources of ignition.
- **Do not** pressurize, cut, heat, or weld containers.
- Empty product containers may contain product residue.
- **Do not** reuse empty containers without commercial cleaning or reconditioning.
- Keep away from sources of ignition and from contact with oxidizing materials and strong acids

Conditions for safe storage, including any incompatibilities

- Store in a cool, well ventilated place away from incompatible materials.
 - Fireproof. Separated from strong oxidants and strong acids.
 - Protect material from direct sunlight.
 - Material will accumulate static charges, which may cause an electrical spark (ignition source).
 - Use proper grounding procedures.
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8. Exposure Controls/Personal Protection

Appropriate engineering controls

- The use of local exhaust ventilation is recommended to control emissions near the source.
- Laboratory samples should be handled in a fume hood.
- Provide mechanical ventilation of confined spaces.
- Use explosion-proof ventilation equipment.

Personal Protective Equipment (PPE)

- The selection of personal protective equipment varies depending upon conditions of use.
- **Skin:** Prevent skin contact. Wear appropriate personal protective clothing to prevent skin contact.
- **Eyes:** Prevent eye contact. Wear appropriate eye protection to prevent eye contact.
- **Wash skin:** When contaminated. The worker should immediately wash the skin when it becomes contaminated.
- **Remove:** When wet (flammable). Work clothing that becomes wet should be immediately removed due to its flammability hazard (i.e., for liquids with a flash point <100°F).
- **Change:** No recommendation. No recommendation is made specifying the need for the worker to change clothing after the work shift.
- Where prolonged and/or repeated skin and eye contact is likely to occur, wear safety glasses with side shields, long sleeves, and chemical resistant gloves.
- Where eye contact is unlikely, but may occur as a result of short and/or periodic exposures, wear safety glasses with side shields.

Respirator Recommendations (NIOSH/OSHA)

Up to 900 ppm:

- (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
- (APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
- (APF = 10) Any supplied-air respirator*
- (APF = 50) Any self-contained breathing apparatus with a full facepiece



Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000). Any supplied-air respirator that

has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

APF: Assigned Protection Factor

9. Physical And Chemical Properties

| Property | Value, Description |
|---|-------------------------------------|
| Appearance (physical state, colour etc); | Clear, colourless liquid. |
| Odour; | Aromatic odour. |
| Odour threshold; | Not available |
| pH; | Not applicable |
| Melting point/freezing point; | -35 deg C |
| Initial boiling point and boiling range; | 139 to 141 deg C |
| Flash point; | 27 deg C TCC Minimum |
| Evaporation rate; | 0.8 Approximate |
| Upper/lower flammability or explosive limits; | 1.9 to 12.3 % by volume Approximate |
| Vapour pressure; | 1.893 kPa at 38 deg C Approximate |
| Vapour density; | 3.7 (Air = 1) |
| Relative density; | 0.87 at 15.5 deg C |
| Solubility(ies); | 0.02% at 25 deg C in water |
| Partition coefficient: n-octanol/water; | Not available |
| Auto-ignition temperature; | 500 deg C Approximate |
| Decomposition temperature; | Not available |
| Viscosity. | 0.69 cST at 25 deg C Approximate |

10. Stability And Reactivity

Reactivity/Chemical Stability: This product is stable under normal temperature and pressure

Possibility Of Hazardous Reactions: Hazardous polymerization will not occur

Conditions To Avoid: Temperature above ambient, ignition sources

Incompatible Materials: Strong oxidizing agents, concentrated nitric and sulphuric acids, acetic acid, halogen, molten sulphur and 1,3-dichloro-5,5-dimethyl-2,4-imidazolidindione (dichlorohydrantoin).

Hazardous Decomposition Products: carbon monoxide, carbon dioxide



11. Toxicological Information

LD50: 4-g/kg oral rat

LC50: 6,500-ppm rat

Inhalation: High vapour/aerosol concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death. Negligible hazard at normal temperatures (up to 38 deg C).

Eye Contact: Irritating, but will not injure eye tissue.

Skin Contact: Frequent or prolonged contact may irritate the skin.

Low toxicity. Brief contact with the liquid will not result in significant irritation unless evaporation is prevented. Skin contact may aggravate an existing dermatitis condition.

Ingestion: Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause mild to severe pulmonary injury and possibly death. Low toxicity.

Special Health Precautions: Health studies have shown that many petroleum hydrocarbons pose potential human health risks, which may vary, from person to person. As a precaution, exposure to liquids, vapours, mists or fumes should be minimised.

Occupational Exposure Limit

ACGIH Recommends: For Xylene, 100 ppm (434 mg/m³).

The previous OSHA limit for the xylenes was 100 ppm as an 8-hour TWA. Based on the ACGIH recommendation, OSHA proposed to revise this limit to a TWA of 100 ppm and a 15-minute STEL of 150 ppm. NIOSH (Ex. 8-47, Table N1) as well as the AFL-CIO (Ex. 194) concurred with these limits, and they are established in the final rule. The xylene isomers are clear, flammable liquids with an aromatic hydrocarbon odor.

Rats and rabbits exposed to a mixture of xylene isomers at a concentration of 690 ppm for eight hours daily, six days per week showed no blood abnormalities, but rabbits exposed on the same regimen at 1150 ppm for 55 days showed a decrease in red and white blood cell counts and an increase in platelet count (Fabre and Truhaut 1954, as cited in ACGIH 1986/Ex. 1-3, p. 637).

Studies of workers exposed to xylene revealed headache, fatigue, lassitude, irritability, and gastrointestinal disturbances as the most common symptoms (Gerarde 1960d/Ex. 1-738a). At unspecified exposure levels, Browning (1965b/Ex. 1-1016) also noted gastrointestinal disturbances, in addition to kidney, heart, liver, and neurological damage; blood dyscrasias, some of which resulted in death, were also reported in these workers. A study by Nelson, Enge, Ross et al. (1943/Ex. 1-66), in which human volunteers were exposed to 200 ppm xylene, found eye, nose, and throat irritation in the subjects at this level of exposure.

NIOSH developed a criteria document for xylene in 1975 (NIOSH 1975; as cited in ACGIH 1986/Ex. 1-3, p. 637), in which the work of Morley, Eccleston, Douglas, and colleagues (1970/Ex. 1-794) was discussed. These authors observed liver dysfunction and renal impairment in three workers overexposed to xylene (estimated concentration of 10,000 ppm). One of these workers died, but the others recovered slowly. Furniture polishers were reported by Matthaues (1964/Ex. 1-830) to have suffered corneal damage as a result of exposure to xylene at unknown concentrations.

One other commenter, Stanley L. Dryen of Chevron Corporation (Ex. 3-896, p. 15), objected to OSHA's issuing of a STEL, stating that there was no basis for one. OSHA disagrees and points out that a 100-ppm TWA limit alone would permit short-term exposure to several hundred ppm xylene, well above the 200-ppm level reported to be irritating as a result of short-term exposures. OSHA notes that NIOSH also recommends a short-term limit to supplement the TWA.



After reviewing this evidence, OSHA concludes that both a TWA and a STEL are necessary to prevent the risks of narcosis, blood effects, and irritant effects at the elevated levels possible at the current exposure limit. The Agency considers the effects of narcosis, irritation, and blood effects to constitute material impairments of health and functional capacity. Therefore, to reduce the risk of irritation to workers exposed to the xylenes, OSHA is establishing a 150-ppm STEL and a 100-ppm TWA for xylene isomers in the final rule.

12. Ecological Information

Fish: Toxic: $1 < LC/EC/IC50 \leq 10$ mg/l

Aquatic Invertebrates: Toxic: $1 < LC/EC/IC50 \leq 10$ mg/l

Algae: Toxic: $1 < LC/EC/IC50 \leq 10$ mg/l

Mobility: If product enters soil, it will be highly mobile and may contaminate groundwater. Floats on water.

Persistence/degradability: Readily biodegradable. Oxidises rapidly by photochemical reactions in air.

Bioaccumulation: Does not bioaccumulate significantly.

Other Adverse Effects: In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

13. Disposal Considerations

- **Material Disposal:** Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
 - **Container Disposal:** Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not, puncture, cut, or weld uncleaned drums. Send to drum recoverer or metal reclaimer.
 - **Local Legislation:** Disposal should be in accordance with applicable regional, national, and local laws and regulations.
 - Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations.
 - **Do not** let this chemical enter the environment.
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14. Transport Information

UN Number: 1307

Shipping Name: Xylenes or Xylenes Solution

Packing Group: III

Primary TDG: Class 3

Subsidiary TDG: Class 9.2

Note: C

Xn symbol

R: 10-20/21-38

S: 2-25

UN Hazard Class: 3

UN Packing Group: III

Transport Emergency Card: TEC (R)-30S1307-III

WHMIS Information:

Class B, Division 2: Flammable Liquids

Class D, Division 2, Subdivision B: Toxic Material

**Transport in Bulk (Annex II of MARPOL 73/78 and the IBC code)**

Pollution Category : Y

Ship Type : 2

Product Name : Xylenes

15. Regulatory InformationPermissible Exposure Level (Long Term) in Singapore: 100ppm (434mg/m³)Permissible Exposure Level (Short Term) in Singapore: 150ppm (651mg/m³)

TWA; 150 ppm as STEL A4 (ACGIH 2001). BEI specified by (ACGIH 2001).

EU OEL: 50 ppm as TWA; 100 ppm as STEL (skin) (EU 2000).

OSHA PEL: TWA 100 ppm (435 mg/m³)NIOSH REL: TWA 100 ppm (435 mg/m³) ST 150 ppm (655 mg/m³)

NIOSH IDLH: 900 ppm

NFPA Code: H 2; F 3; R 0

ICSC # 0085

CAS # 108-38-3

UN # 1307

EC # 601-022-00-9

16. Other Information

Prepared By: Material Safety Committee

SDS Prepared on: 1/12/2010

Reviewed 1 on 1/10/2013

Revised 2 on 11/2/2015

Revised 3 on 18/3/2015

Revised 4 on 10/10/2016

| Revision (2) Notes | |
|---------------------------|--|
| 1 | Sect. 14: Added information for Transport in Bulk according to MARPOL 73/78 Annex II |
| Revision (3) Notes | |
| 1 | Sect. 2: Flammable Liquid hazard category changed from 2 to 3 |
| Revision (4) Notes | |
| 1 | Sect. 2: Added Hazard Statement for carcinogenicity |

CAUTION: The information given above (“**the Information**”) relates only to the substance or mixture listed herein. The Information may not be valid when used in combination with any other substance or mixture or in any process. If the substance or mixture is to be used for a purpose other than that stated herein or under conditions other than specified herein, the Information cannot be relied upon as being complete or accurate, and the user is advised to consult the supplier before using the substance or mixture for such other purpose or under such other conditions. The Information is given based on information available at the indicated date of preparation and no representation or warranty is given that it will be correct as of any time after the indicated date of preparation.

GHS Label

Xylene



DANGER

Hazard Statements

- Flammable liquid and vapour
- May be harmful if swallowed
- Harmful if inhaled
- Causes skin irritation
- Causes serious eye irritation
- Suspected of causing cancer
- May damage fertility or the unborn child
- May cause damage to organs
- May cause damage to organs through prolonged or repeated exposure
- May be fatal if swallowed and enters airways
- Toxic to aquatic life

Precautionary Statements

- Keep container tightly closed.
- Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
- Wear protective gloves /protective clothing/eye protection/face protection
- Ground/Bond container and receiving equipment
- Use explosion-proof electrical/ventilating/lighting equipment.
- Take precautionary measures against static discharge.
- Use only non-sparking tools.
- Do not eat, drink or smoke when using this product.
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Avoid release to the environment

For further information on this product, refer to Manufacturer's Safety Data Sheet

Contact detail of the supplier : 100 Ayer Merbau Road, Singapore 628277
Emergency contact : +65 68672102