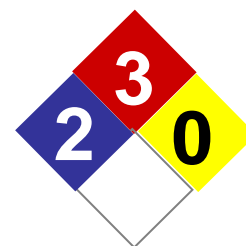


Appendix A

Mixed Xylenes

CAS No. Mixture



1. Product and company information

Trade Name	Mixed Xylenes		
Chemical Name	Mixed Xylenes		
Synonyms	xylene (xylo); xylo; methyl toluene; benzene, dimethyl-; dimethylbenzene.		
CAS No.	Mixture		
EUEINECS/ELINICS No.	N/A		
UN No.	1307	UN Class	3
Chemical formular	N/A		
Material use	This product is intended for use as a refinery feedstock, fuel, or for use in engineered processes. Use in other applications may result in higher exposures and require additional controls, such as local exhaust ventilation and personal protective equipment.		
Manufacturer	Map Ta Phut Olefins		
	www.chemicals.scg.co.th		

2. Hazard Identification

Potential Health Effects

Inhalation:

Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest and sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm. Repeated or prolonged exposure may cause behavioral changes.

Ingestion:

Harmful if swallowed.

Skin contact:

Prolonged or repeated contact may cause moderate irritation, defatting (cracking), redness, itching, inflammation, dermatitis and possible secondary infection. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Injury may not appear serious at first. Within a few hours, tissues will become swollen, discolored and extremely painful.

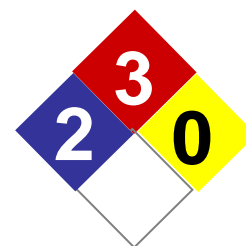
Eye contact:

May cause severe irritation, redness, tearing, blurred vision and conjunctivitis

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3. Composition

Component	CAS No.	Concentration (%)
Xylene (o,m,p isomers)	1330-20-7	60 - 95
Ethylbenzene	100-41-4	2 - 35
Hexane (Other Isomers)	mixture	1 - 4

Additional Information:

The actual % concentration varies based on operating conditions.

4. First Aid Measure

Inhalation:

Remove to fresh air. If breathing is difficult, ensure clear airway and administer oxygen. If not breathing, apply artificial respiration or cardiopulmonary resuscitation. Keep person warm, quiet and get medical attention.

Ingestion:

Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If potentially dangerous quantities of this material have been swallowed, call a physician immediately

Skin Contact:

In case of contact, immediately flush skin with plenty of water. Wash exposed area thoroughly with soap and water. Remove contaminated clothing promptly and launder before reuse. Contaminated leather goods should be discarded. If irritation persists or symptoms described in the MSDS develop, seek medical attention. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Get immediate medical attention.

Eye Contact:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

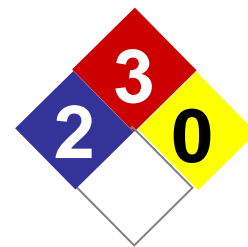
Notes to physician:

In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an intratracheal tube, to prevent aspiration. Irregular heart beat may occur; use of adrenalin is not advisable. Individuals intoxicated by the product should be hospitalized immediately, with acute and continuing attention to neurological and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode, individuals should be monitored for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be monitored for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will be more seriously impaired, and recovery from inhalation exposure may be complicated. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

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5. Fire Fighting Measure

Flammability of the product : Flammable.

Auto-ignition temperature : 463.3 to 528.9°C (865.9 to 984°F)

Flash point : Closed cup: 26.85 to 31.85°C (80.3 to 89.3°F).

Flammable limits : Lower: 1% Upper: 7%

Products of combustion : These products are carbon oxides (CO, CO₂).

Fire-fighting media and instructions : Flammable Liquid. Use dry chemical, foam or carbon dioxide to extinguish the fire. Consult foam manufacturer for appropriate media, application rates and water/foam ratio. Water can be used to cool fire- exposed containers, structures and to protect personnel. If a leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak. Use water to flush spills away from sources of ignition. Do not flush down public sewers. Collect contaminated fire-fighting water separately. It must not enter the sewage system. Dike area of fire to prevent runoff. Decontaminate emergency personnel and equipment with soap and water. Flammable liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. Instructions

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental Release Measure

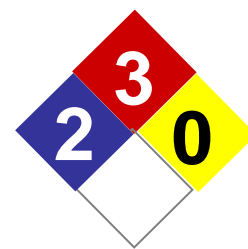
Personal precautions : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Do not touch or walk through spilled material. Tanks, vessels or other confined spaces which have contained product should be freed of vapors before entering. The container should be checked to ensure a safe atmosphere before entry. Empty containers may contain toxic, flammable/combustible or explosive residues or vapors. Do not cut, grind, drill, weld or reuse empty containers that contained this product. Do not transfer this product to another container unless the container receiving the product is labeled with proper DOT shipping name, hazard class and other information that describes the product and its hazards.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. If facility or operation has an "oil or hazardous substance contingency plan" activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Extremely flammable. Review Fire and Explosion Hazard Data before proceeding with clean up. Keep all sources of ignition (flames, smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area Recover as much product as possible

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(e.g., by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines

Methods for cleaning up : If emergency personnel are unavailable, contain spilled material. For small spills, add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion-proof means to transfer material to a sealable, appropriate container for disposal. For large spills, dike spilled material or otherwise contain it to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

7. Handling and Storage

Handling : Do not ingest. Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling. Use only in well ventilated locations. Keep away from heat, spark and flames. In case of fire, use water spray, foam, dry chemical or carbon dioxide as described in the Fire and Explosion Hazard Data section of the MSDS. Do not pressurize, cut, weld, braze, solder, drill on or near this container. "Empty" container contains residue (liquid and/or vapor) and may explode in heat of a fire. Keep out of reach of children. Failure to use caution may cause serious injury or illness. Use good personal hygiene practices. After handling this product, wash hands before eating, drinking, or using toilet facilities.

Storage : Store in tightly closed containers in cool, dry, isolated and well ventilated area away from heat, sources of ignition and incompatible materials. Use non-sparking tools and explosion proof equipment. Ground lines, containers, and other equipment used during product transfer to reduce the possibility of a static induced spark. Do not "switch load" because of possible accumulation of a static charge resulting in a source of ignition. Use good personal hygiene practices.

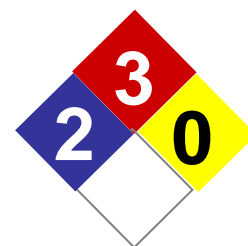
8. Exposure Control and Personal Control

Engineering controls : Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are close to the workstation location.

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Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Keep away from eyes. Eye contact can be avoided by wearing safety glasses or chemical splash goggles.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Keep away from skin. Skin contact can be minimized by wearing protective gloves such as neoprene, nitrile-butadiene rubber, etc. and, where necessary, impervious clothing and boots. Leather goods contaminated with this product should be discarded. A source of clean water should be available in the work area for flushing eyes and skin. Flame Retardant Clothing is recommended.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workplace exposure limits for product or components are exceeded, NIOSH approved equipment should be worn. Proper respirator selection should be determined by adequately trained personnel, based on the contaminants, the degree of potential exposure and published respiratory protection factors. This equipment should be available for nonroutine and emergency use.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Personal protective equipment (Pictograms) : Consult your Supervisor or S.O.P. for special handling directions.



Personal protection in case of a large spill: Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be adequate. Consult a specialist before handling this product. Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product.

Component

Xylene (o,m,p isomers)

Exposure limits

ACGIH TLV (United States, 5/2004).

STEL: 150 ppm 15 minute/minutes. Form: All forms

TWA: 100 ppm 8 hour/hours. Form: All forms

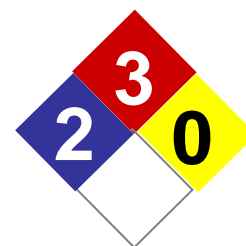
OSHA PEL (United States, 6/1993).

TWA: 100 ppm 8 hour/hours. Form: All forms

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Ethylbenzene

ACGIH TLV (United States, 1/2004).

STEL: 125 ppm 15 minute/minutes. Form: All forms

TWA: 100 ppm 8 hour/hours. Form: All forms

NIOSH REL (United States, 6/2001).

STEL: 125 ppm 15 minute/minutes. Form: All forms

TWA: 100 ppm 10 hour/hours. Form: All forms

OSHA PEL (United States, 6/1993).

TWA: 100 ppm 8 hour/hours. Form: All forms

Hexane (Other Isomers)

ACGIH TLV (United States, 9/2004).

STEL: 1000 ppm 15 minute/minutes. Form: All forms

TWA: 500 ppm 8 hour/hours. Form: All forms

NIOSH REL (United States, 6/2001).

CEIL: 510 ppm 15 minute/minutes. Form: All forms

Consult local authorities for acceptable exposure limits.

9. Physical and Chemical Properties

Physical state	: Liquid. (COLORLESS LIQUID WITH AROMATIC ODOR)
Color	: Colorless.
Odor	: LIKE BENZENE; CHARACTERISTIC AROMATIC
Molecular formula	: C ₈ -H ₁₀
Boiling point	: 138.85°C (281.9°F)
Melting/freezing point	: -26.15°C (-15.1°F)
Specific gravity	: 0.861 (Water = 1)
Vapor density	: 3.7 (Air = 1)
Volatility	: 100% (v/v).
Evaporation rate	: 0.77 compared with Butyl acetate.
VOC	: 100 (%)
Solubility	: Very slightly soluble in cold water.

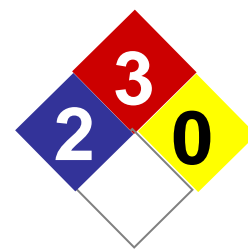
10. Stability and Reactivity Information

Stability and reactivity	: The product is stable.
Incompatibility with various substances	: Extremely reactive or incompatible with oxidizing agents, reducing agents, acids, alkalis.
Hazardous decomposition products	: These products are carbon oxides (CO, CO ₂).

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Hazardous polymerization : Will not occur.

11. Toxicological Information

Toxicity data

XYLENE can affect the body if it is inhaled, comes in contact with the eyes or skin or it is swallowed. It may also enter the body through the skin. Xylene vapor irritates the eyes, mucous membranes and skin. At high concentrations it causes narcosis. In animals, xylene causes blood changes reflecting mild toxicity to the hematopoietic system. Laboratory animals exposed by various routes to high doses of xylene showed evidence of effects in the liver, kidneys, lungs, spleen, heart and adrenals. Rats exposed to xylene vapor during pregnancy showed embryo/fetotoxic effects. Mice exposed orally to doses producing maternal toxicity also showed embryo or fetotoxic effects. Laboratory rats exposed to high concentrations of toluene experienced recordable hearing loss. In humans, exposure to high concentrations can cause dizziness, excitement, drowsiness, incoordination and a staggering gait. Workers exposed to concentrations above 200 ppm complain of anorexia, nausea, vomiting and abdominal pain. Brief exposures of humans to 200 ppm caused irritation of the eyes, nose and throat. There are reports of reversible corneal vacuolation in workers exposed to xylene, or to xylene plus other volatile solvents.

ETHYLBENZENE can affect the body if it is inhaled, swallowed or comes in contact with the eyes or skin. It is primarily an irritant of skin, and to some degree, of eyes and upper respiratory tract. Systemic absorption causes depression of the central nervous system with narcosis at very high concentrations. On the eyes and nose, the vapor at 5000 ppm causes intolerable irritation, eye irritation and lacrimation are immediate and severe at 2000 ppm, irritation and tearing occur at 1000 ppm although tolerance develops rapidly, and the vapor is a transient irritant on human eyes at 200 ppm. Aspiration of small amounts causes extensive edema and hemorrhage of lung tissue. A draft report on a study conducted by the National Toxicology program states that lifetime inhalation exposure of rats and mice to concentrations of ethylbenzene(750 ppm) resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations of ethylbenzene (75 ppm or 250 ppm). The draft report does not address the relevance of these results to humans.

HEXANE ISOMERS are three times as toxic to mice as is pentane. Narcosis was produced in mice within 30-60 minutes at concentrations of 30,000 ppm In man, concentrations for 10 minutes at 2000 ppm produced no effects, but 5000 ppm caused dizziness and a sense of giddiness. Concentrations of 1400-1500 ppm produced slight nausea, headache, eye, and throat irritation.

<u>Ingredient name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Xylene (o,m,p isomers)	LD50	4300 mg/kg	Oral	Rat
	LD50	2119 mg/kg	Oral	Mouse
	LD50	4300 mg/kg	Oral	Mammal
	LD50	>1700 mg/kg	Dermal	Rabbit
	LDLo	50 mg/kg	Oral	human
Ethylbenzene	LD50	3500 mg/kg	Oral	Rat

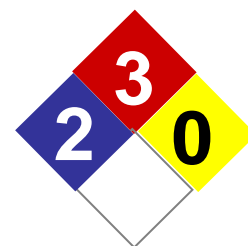
IDLH : 500 ppm Xylenes

Chronic effects on humans : CARCINOGENIC EFFECTS: Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Xylene (o,m,p isomers)]. Classified A3 (Proven for animals.) by

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ACGIH, 2B (Possible for humans.) by IARC [Ethylbenzene]. Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Toluene]. Classified A1 (Confirmed for humans.) by ACGIH, 1 (Proven for humans.) by IARC, 1 (Known to be human carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for humans.) by European Union [Benzene]. Contains material which causes damage to the following organs: blood, kidneys, liver, gastrointestinal tract, upper respiratory tract, skin, bone marrow, central nervous system (CNS), eye, lens or cornea.

Other toxic effects on humans : Hazardous in case of skin contact (irritant).

Specific effects

Carcinogenic effects : Contains material which may cause cancer, based on animal data. Risk of cancer depends on duration and level of exposure.

Target organs : Causes damage to the following organs: blood, kidneys, liver, gastrointestinal tract, skin, eyes, central nervous system (CNS), eye, lens or cornea. Contains material which causes damage to the following organs: upper respiratory tract.

12. Ecological Information

Ecotoxicity data

Ingredient name	Species	Period	Result
Xylene (o,m,p isomers)	Oncorhynchus mykiss (LC50)	96 hour/hours	3.3 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	8.2 mg/l
	Lepomis macrochirus (LC50)	96 hour/hours	8.6 mg/l
	Lepomis macrochirus (LC50)	96 hour/hours	12 mg/l
	Lepomis macrochirus (LC50)	96 hour/hours	13.3 mg/l
	Pimephales promelas (LC50)	96 hour/hours	13.4 mg/l
Ethylbenzene	Daphnia magna (EC50)	48 hour/hours	2.93 mg/l
	Daphnia magna (EC50)	48 hour/hours	2.97 mg/l
	Selenastrum capricornutum(EC50)	48 hour/hours	7.2 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	4.2 mg/l
	Pimephales promelas (LC50)	96 hour/hours	9.09 mg/l
	Poecilia reticulata (LC50)	96 hour/hours	9.6 mg/l

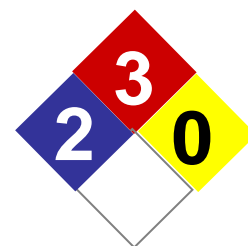
Products of degradation : These products are carbon oxides (CO, CO2) and water.

Toxicity of the products of biodegradation : The products of degradation are less toxic than the product itself.

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13. Disposal Consideration

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Consult your local or regional authorities.

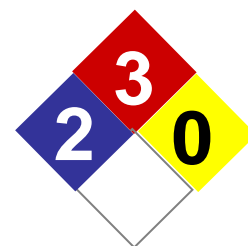
14. Transportation information


Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1307	XYLENES	3	II		<p>Reportable quantity 1000 lbs. (453.6 kg)</p> <p>Limited quantity Yes.</p> <p>Packaging instruction Passenger aircraft Quantity limitation: 5 L</p> <p>Cargo aircraft Quantity limitation: 60 L</p> <p>Special provisions IB2, T4, TP1</p>

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TDG Classification	UN1307	XYLENES	3	II		Not available.
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15. Regulatory Information

United States

U.S. Federal regulations : TSCA 4(a) final test rules: Hexane (Other Isomers)
TSCA 8(b) inventory: Xylene (o,m,p isomers); Ethylbenzene; Hexane (Other Isomers)
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Xylene (o,m,p isomers); Ethylbenzene;
Hexane (Other Isomers)
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Xylene (o,m,p isomers): Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Ethylbenzene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Hexane (Other Isomers): Fire hazard, Immediate (acute) health hazard
Clean Water Act (CWA) 307: Ethylbenzene
Clean Water Act (CWA) 311: Xylene (o,m,p isomers); Ethylbenzene
Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R – Reporting requirements	Xylene (o,m,p isomers)	1330-20-7	60 - 95
	Ethylbenzene	100-41-4	2 – 35
Supplier notification	Xylene (o,m,p isomers)	1330-20-7	60 - 95
	Ethylbenzene	100-41-4	2 – 35

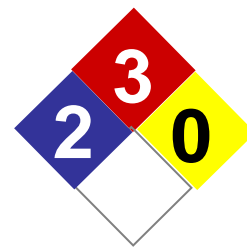
SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : Connecticut hazardous material survey.: Xylene (o,m,p isomers); Ethylbenzene
Illinois toxic substances disclosure to employee act: Xylene (o,m,p isomers); Ethylbenzene
Rhode Island RTK hazardous substances: Xylene (o,m,p isomers); Ethylbenzene

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Pennsylvania RTK: Xylene (o,m,p isomers): (environmental hazard, generic environmental hazard); Ethylbenzene: (environmental hazard, generic environmental hazard); Hexane (Other Isomers): (generic environmental hazard)

Florida: Xylene (o,m,p isomers); Ethylbenzene

Michigan critical material: Xylene (o,m,p isomers)

Massachusetts RTK: Xylene (o,m,p isomers); Ethylbenzene; Hexane (Other Isomers)

New Jersey: Xylene (o,m,p isomers); Ethylbenzene

WARNING: This product contains chemical/chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.: Ethylbenzene; Toluene; Benzene

WARNING: This product contains chemical/chemicals known to the state of California to cause reproductive harm (female).: No products were found.

WARNING: This product contains chemical/chemicals known to the state of California to cause reproductive harm (male).: Benzene

California prop. 65 (no significant risk level): Benzene

California prop. 65 (Maximum Acceptable Dosage Level): Toluene; Benzene

WARNING: This product contains chemical/chemicals known to the state of California to cause birth defects or other reproductive harm.: Toluene; Benzene

WARNING: This product contains chemical/chemicals known to the state of California to cause cancer.: Ethylbenzene; Benzene

Canada

WHMIS (Canada)

: CEPA DSL: Xylene (o,m,p isomers); Ethylbenzene; Hexane (Other Isomers)

Class B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).

Class D-2A: Material causing other toxic effects (Very toxic).

Class D-2B: Material causing other toxic effects (Toxic).

16. Other information

This material safety data sheet is prepared by Map Ta Phut Olefins Co., Ltd.

Revision 00

1 NOV 2009

Key/Legend

CAS: Chemical Abstract Service

CFR: Code of Federal Regulations

CNS: Central Nervous System

DOT: Department of Transportation

EC₅₀: Effective concentration of a substance that causes 50% of the maximum response

EINECS: European Inventory of Existing Commercial Chemical Substances

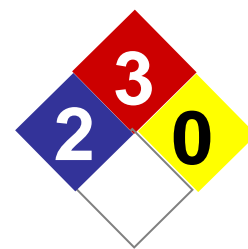
EPA: Environmental Protection Agency

EU: European Union

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

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HCS: Hazard Communication Standard
IARC: International Agency for the Research on Cancer
IARC: International Agency For Research On Cancer
LC₅₀: Lethal Concentration cause death in 50% of a defined experimental animal population
LD₅₀: Lethal dose cause death in 50% of a defined experimental animal population
MSDS: Material Safety Data Sheet
NOEC : No observed effect concentration
NFPA: National Fire Protection Association
NIOSH: National Institute of Occupational Safety and Health
NTP: National Toxicology Program
OSHA: U.S. Occupational Safety & Health Administration
PEL: Permissible Exposure Limit (OSHA)
RCRA: Resource Conservation and Recovery Act
REL: Recommended Exposure Limit (NIOSH)
SCBA: Self-Contained Breathing Apparatus
STEL: Short-Term Exposure Limit (generally 15 minutes)
TLV: Threshold Limit Value (ACGIH)
TWA: Time Weighted Average (8 hr.)
UN: United Nations

END OF DOCUMENT