

Material Safety Data for: Xylene

1. PRODUCT IDENTIFICATION

Name dimethylbenzene
Synonyms xylene – “xylol” is an obsolete term
CAS# 1330-20-7
Europe EC# 215-535-7
Product Uses solvent, diluent, chemical feedstock, gasoline octane improver

2. INGREDIENTS

	%	TWAEV / TLV ppm / mg/m ³	LD ₅₀ ORAL	(mg/kg) SKIN	LC ₅₀ ppm INHALATION
Dimethyl Benzene (mixed isomers)*	100%	100 / 435	2120	1700	5000

*The mixed isomers usually include ~20% Ethylbenzene (CAS# 100-41-4).

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: flammable liquid, heavy vapour may travel, distant ignition and flashback are possible; readily accumulates a static charge; central nervous depressant, irritating to skin and eyes, suspected reproductive toxin

Canada – WHMIS

Key:

B 2, D 2A

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

U.S.A. – HMIS

Key:

Health – 2, Fire – 2, Reactivity – 0

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

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact	moderately irritating; redness, swelling, burning sensation (<i>all rapidly & readily reversible</i>)
Skin Absorption	some; no toxic effects likely by this route
Eye Contact	liquid is a mild irritant; vapour irritating above 200ppm to some people
Inhalation	above 100ppm objectionable; above 200ppm irritating; above 300ppm, dizziness, drowsiness, intoxication, nausea; eventual pulmonary oedema if sufficient product is inhaled
Ingestion	dizziness, drowsiness, intoxication, nausea, vomiting may occur if sufficient is ingested

Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis & skin cracking due to powerful degreasing action; may damage liver & kidneys (<i>this may have been due to other chemicals in the workplace</i>); headaches, insomnia, depression have been attributed to xylene vapour exposure – <i>equivocal evidence for this</i>
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	fetotoxic in rodents on prolonged maternal exposure to 500ppm; no known effect in humans
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD ₅₀ (oral)	3520, 4300 & 5400mg/kg (rat), 2120 & 5250mg/kg (mouse),
LD ₅₀ (skin)	>1700 & 12,180mg/kg (rabbit)
LC ₅₀ (inhalation)	5000, 6350 & 6700ppm (rat)

Please ensure that this MSDS is given to, and explained to people using this product.

4. FIRST AID

- SKIN:** Wash with soap and 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.

5. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless liquid with moderate aromatic (<i>gasoline-like</i>) odour
Odour Threshold	1ppm – <i>good warning properties relative to the TLV</i>
Vapour Pressure	6-6.5mmHg / 0.8-0.87kPa (20°C / 68°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	0.7
Vapour Density (air = 1)	3.7
Boiling Range	137-142°C / 279-284°F – <i>depends on proportions of various isomers present</i>
Freezing Point	-55°C / -69°F – <i>depends on proportions of various isomers present</i>
Specific Gravity	0.86 (20/20°C)
Water Solubility	130 milligrams per litre
Also soluble in	most organic solvents
Viscosity	0.7 centipoise (25°C / 77°F)
pH	none – (<i>does not liberate hydrogen ions when dissolved</i>)
Conversion Factor	1ppm = 4.33mg/m ³
Molecular Weight	106grams per mole

6. FLAMMABILITY & FIRE FIGHTING

Flash Point	17-25°C / 63-77°F (closed cup) – <i>variable, depending on the proportions of isomers present</i>
Autoignition Temperature	464°C / 867°F
Flammable Limits	1% – 7%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments including toxic aldehydes
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	readily accumulates a static charge on agitation or pumping <i>which can cause ignition</i>

7. STABILITY / REACTIVITY

Dangerously Reactive With	strong oxidising agents; nitric acid or dichlorohydrantoin can cause explosion; molten sulphur, halogens
Also Reactive With	attacks some plastics (eg: PVC) and rubbers
Stability	stable; will not polymerize
Decomposes in Presence of	not known
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

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8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

ACGIH TLV	100ppm / 434mg/m ³
OSHA PEL	100ppm / 435mg/m ³
STEL	150ppm / 651mg/m ³
Ventilation	mechanical ventilation may be required to control airborne titre below regulated limits; respirators with an organic vapour cartridge should be available to workers in the area in case ventilation fails (<i>store respirator in air-tight container such as Tupperware or ZipLock to maintain "freshness"</i>)
Hands	"Viton" gloves – <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

9. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat and oxidising agents. Use non-sparking bronze or aluminium hand tools. All electrical and mechanical equipment (including lighting, switchgear and forklift trucks) used with or around this product must be explosion-proof.

Always ground or electrically bond both the source container and 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. Empty containers may contain a flammable / explosive vapour. Always ensure that containers, whether empty or full, or part full, are tightly sealed 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 (see Part 8).

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.

WHEN FILLING BULK STORAGE TANKS WITH THIS PRODUCT, IN ADDITION TO NORMAL GROUNDING PROCEDURES, READ THE FOLLOWING:
This product may form an explosive mixture inside a bulk storage tank. Prior to filling a bulk storage tank with this product, consider ventilating the headspace with nitrogen. In addition, consider asking the supplier to put an anti-static additive in the product when you order. If the bulk tank has a floating product level indicator, this should be inspected regularly. The float MUST HAVE a firmly fixed ground wire connecting it to its support cable. This connection must be free of corrosion.
Consult NFPA 77, 2007: "Recommended Practice on Static Electricity"

10. SPILL PROCEDURES

Fire Potential: blanket spill with foam as a precaution against accidental ignition. Take care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.

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 & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

11. DISPOSAL

Waste Disposal	do not flush to sewer , recycle solvent if possible, if local regulations permit, may be put in sanitary landfill, may be incinerated in approved facility
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>

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(Xylene, cont'd)

page 4

12. ENVIRONMENTAL INFORMATION

Bioaccumulation	this product is readily metabolised and is not a bioaccumulator
Biodegradation <i>other</i>	this product degrades readily and rapidly in the presence of oxygen; 72% over 20 days – <i>various more rapid biodegradation results have been reported</i>
Abiotic Degradation	xylene reacts with atmospheric hydroxyl radicals; ½-life in air is 1-2 days depending on the isomer
Mobility in soil, water	this product is sufficiently water soluble to move quite readily in soil and water
Aquatic Toxicity	
LC ₅₀ (Fish, 96hr)	13.5-17.3mg/litre (Oncorhynchus mykiss), 780mg/litre (Cyprinus carpio), 26.7mg/litre (Pimephelas promelas) & others
EC ₅₀ (Crustacea, 48hr)	0.35 & 0.6mg/litre (Gammarus lacustris), 8.5mg/litre (Palaemonetes pugio)
EC ₅₀ (Algae)	various tests, but no EC ₅₀ given

13. TRANSPORT REGULATIONS

Canada TDG	PIN	UN-1307
AND	Shipping Name	xylenes
U.S.A. 49 CFR	Class	3
	Packing Group	II
Marine Pollutant		not a marine pollutant

14. 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
	NOTE: Xylene is listed on the chemical inventory of most countries

Europe Risk Phrases R: 10-20/21-38 – Flammable. Harmful by inhalation & in contact with skin. Irritating to the skin.

Europe Safety Phrases S: 25 – Avoid contact with the eyes.

Allowable Tolerances: Xylene is exempted from the requirement of a tolerance when used as an aquatic herbicide applied to irrigation conveyance systems in accordance with the following conditions: (a) It is to be used only in programs of the Bureau of Reclamation, US Department of Interior and cooperating water user organizations. (b) It is to be applied as an emulsion at an initial concn not to exceed 750 ppm. (c) It is not to be applied when there is any likelihood that the irrigation water will be used as a source of raw water for a potable water system or where return flows of such treated irrigation water into receiving rivers and streams would contain residues of xylene in excess of 10 ppm. (d) Xylene to be used as an aquatic herbicide shall meet the requirement limiting the presence of a polynuclear aromatic hydrocarbons as listed in 172.250 of title 21, Code of Federal Regulations. Residues of xylene (meeting the specifications listed in 21 CFR 172.884(b)(4)) are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. Use: solvent, cosolvent. Limit: in pesticide formulations for grain storage only. Residues of xylene are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: solvent, cosolvent. Residues of xylene are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals. Use: solvent, cosolvent.

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 100 ppm (435 mg/cu m) /Xylenes (o-, m-, p- isomers)/ Vacated 1989 OSHA PEL TWA 100 ppm (435 mg/cu m); STEL 150 ppm (655 mg/cu m) is still enforced in some states. /Xylenes (o-, m-, p- isomers)/

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 100 ppm; 15 min Short Term Exposure Limit (STEL): 150 ppm /Xylene (o-, m-, & p- isomers)/ Biological Exposure Index (BEI): Determinant: Methylhippuric acids in urine; Sampling Time: end of shift; BEI: 1.5 g/g creatinine. /Xylenes, Technical or Commercial Grade/ A4; Not classifiable as a human carcinogen. /Xylene (o-,m-, & p- isomers)/

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(Xylene, cont'd)

page 5

15. REGULATIONS, cont'd

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. Xylenes (mixed) are produced, as an intermediate or a final product, by process units covered under this subpart. Listed as a hazardous air pollutant (HAP) generally known or suspected to cause serious health problems. The Clean Air Act, as amended in 1990, directs EPA to set standards requiring major sources to sharply reduce routine emissions of toxic pollutants. EPA is required to establish and phase in specific performance based standards for all air emission sources that emit one or more of the listed pollutants. Xylenes are included on this list.

Federal Drinking Water Standards: EPA 10000 ug/L

Federal Drinking Water Guidelines: EPA 10000 ug/L

State Drinking Water Standards: 1000 ug/L

State Drinking Water Guidelines: Arizona 440 ug/L, Maine 14,000 ug/L, Minnesota 10000 ug/L

Clean Water Act Requirements: Xylene (mixed) is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

CERCLA Reportable Quantities: Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 100 lb or 45.4 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

RCRA Requirements: When xylene is a spent solvent, it is classified as a hazardous waste from a nonspecific source, as stated in 40 CFR 261.31, and must be managed according to State and/or Federal hazardous waste regulations. As stipulated in 40 CFR 261.33, when xylene, as a commercial chemical product or manufacturing chemical intermediate or an off-specification commercial chemical product or a manufacturing chemical intermediate, becomes a waste, it must be managed according to Federal and/or State hazardous waste regulations. Also defined as a hazardous waste is any residue, contaminated soil, water, or other debris resulting from the cleanup of a spill, into water or on dry land, of this waste. Generators of small quantities of this waste may qualify for partial exclusion from hazardous waste regulations (40 CFR 261.5).

FIFRA Requirements: Xylene is exempted from the requirement of a tolerance when used as an aquatic herbicide applied to irrigation conveyance systems in accordance with the following conditions: (a) It is to be used only in programs of the Bureau of Reclamation, US Department of Interior and cooperating water user organizations. (b) It is to be applied as an emulsion at an initial concn not to exceed 750 ppm. (c) It is not to be applied when there is any likelihood that the irrigation water will be used as a source of raw water for a potable water system or where return flows of such treated irrigation water into receiving rivers and streams would contain residues of xylene in excess of 10 ppm. (d) Xylene to be used as an aquatic herbicide shall meet the requirement limiting the presence of a polynuclear aromatic hydrocarbons as listed in 172.250 of title 21, Code of Federal Regulations. Residues of xylene are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals. Use: solvent, cosolvent. Residues of xylene are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: solvent, cosolvent. Residues of xylene (meeting the specifications listed in 21 CFR 172.884(b)(4)) are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. Use: solvent, cosolvent. Limit: in pesticide formulations for grain storage only. Xylene is used as an aquatic herbicide. There is only one registered pesticide product containing xylene as the active ingredient. The current label for this end use product clearly indicates that it is only for use in programs of the Bureau of Reclamation, U.S. Department of Interior, and for its cooperating water user organizations. For this assessment of xylene, occupational handler inhalation and dermal exposures were examined. An oral NOAEL of 150 mg/kg/day was used to assess short-term risks from dermal exposures. The oral dose was converted to an equivalent dermal dose using a 100% dermal absorption factor (a conservative assumption). An inhalation NOAEL of 57.6 mg/kg/day was used to assess short-term risks from inhalation exposures. This endpoint was based on behavioral effects, and is more health protective than some other studies which could have been selected such as those showing reduced body weight gain, developmental effects, or mortality, all of which were seen at higher exposure doses. Available data indicate that xylene is not a carcinogen. Due principally to its high vapor pressure, no residues of xylene are expected to occur on harvested crops as a result of irrigation with xylene-treated waters. Thus, the Agency plans to propose revocation of the tolerance exemption for this use at 40 CFR 180.1025. Further, based on current and future label restrictions, residues in drinking water are expected to be well below the Maximum Contaminant Level (MCL) established by the Agency under the Safe Drinking Water Act. As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their continued use. Under this pesticide reregistration program, EPA examines newer health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether the use of the pesticide does not pose unreasonable risk in accordance to newer safety standards, such as those described in the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA '88 were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern than those on List C, and with List C containing pesticides of greater concern than those on List D. Xylene is found on List C. Case No: 3020; Pesticide type: insecticide; Case Status: OPP is reviewing data from the pesticide's producers regarding its human health and/or environmental effects, or OPP is determining the pesticide's eligibility for reregistration and developing the RED document.; Active ingredient (AI): xylene; AI Status: Registrants of the pesticide have not made or honored a commitment to seek reregistration, conduct the necessary studies, or pay the requisite fees, or they have asked EPA to cancel their product registrations. Unless some other interested party supports them, products containing the pesticide will be cancelled.

FDA Requirements: Xylene is an indirect food additive for use only as a component of adhesives.

16. PREPARATION INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available

Preparation Date: April 2007 Revision Date: April 2010

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