Material Safety Data Sheet

Section 1. Product and Company Identification
Product Name: Xylene, For Histology and Cytology

Manufacturer: EMD Chemicals Inc.
P.O. Box 70
480 Democrat Road
Gibbstown, NJ 08027
Prior to January 1, 2003 EMD Chemicals Inc. was EM Industries, Inc. or EM Science, Division of EM Industries, Inc.

For More Information Call
856-423-6300 Technical Service
Monday–Friday: 8:00 AM – 5:00 PM

In Case of Emergency Call
800-424-9300 CHEMTREC (USA)
613-996-6666 CANUTEC (Canada)
24 Hours/Day: 7 Days/Week

Synonym: Xylol, Dimethylbenzene
Material Uses: Analytical reagent.
Chemical: Aromatic hydrocarbon.
Family:

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>% by Weight</th>
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</thead>
<tbody>
<tr>
<td>p-Xylene</td>
<td>106-42-3</td>
<td>18</td>
</tr>
<tr>
<td>m-Xylene</td>
<td>108-38-3</td>
<td>42</td>
</tr>
<tr>
<td>o-Xylene</td>
<td>95-47-6</td>
<td>19</td>
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<tr>
<td>Ethyl Benzene</td>
<td>100-41-4</td>
<td>21</td>
</tr>
</tbody>
</table>

Section 3. Hazards Identification

Physical State and Appearance: Liquid.
Emergency Overview: DANGER!
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.
MAY BE FATAL IF SWALLOWED.
HARMFUL IF INHALED.
CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
POSSIBLE CANCER HAZARD
CONTAINS MATERIAL WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, KIDNEYS, LIVER, GASTROINTESTINAL TRACT, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
MAY BE HARMFUL IF ABSORBED THROUGH SKIN.

Routes of Entry: Inhalation. Ingestion.
Potential Acute Health Effects
Xylene, For Histology and Cytology

Eyes Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching.

Skin Hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. May be hazardous in case of skin contact (permeator).

Inhalation Hazardous in case of inhalation (lung irritant).

Ingestion Extremely hazardous in case of ingestion. May be fatal if swallowed.

Potential Chronic Health Effects

Carcinogenic Classified 2B (Possible for human.) by IARC [ETHYL BENZENE].

Effects

Medical Conditions Additional information See Toxicological Information (section 11)

Aggravated by deterioration of health by an accumulation in one or many human organs.

Overexposure:

Section 4. First Aid Measures

Eye Contact Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention immediately.

Skin Contact In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flammability of the Product will burn.

Product

Auto–ignition The lowest known value is 431.9 to 459.9°C (809.4 to 859.8°F) (ETHYL BENZENE).

Temperature

Flash Points Closed cup: 29.444°C (85°F).

Flammable Limits LOWER: 1% UPPER: 7%

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

Fire Hazards in Highly flammable in presence of open flames, sparks and static discharge, of shocks, of heat, of oxidizing materials.

Presence of Various Substances

Explosion Hazards in Risks of explosion of the product in presence of static discharge:

Various Substances Highly flammable in presence of open flames, sparks and static discharge.

Highly explosive in presence of open flames, sparks and static discharge.

Risks of explosion of the product in presence of mechanical impact:

Highly flammable in presence of shocks.

Highly explosive in presence of shocks.

Fire Fighting Media SMALL FIRE: Use DRY chemical powder.
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and Instructions

LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Protective Clothing

Be sure to use an approved/certified respirator or equivalent.

(Fire)

Special Remarks

Vapor may travel considerable distance to source of ignition and flash back. (M-XYLENE)

Special Remarks on Fire Hazards

Not available.

Explosion Hazards

Section 6. Accidental Release Measures

Small Spill and Leak

Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill and Leak

Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Spill Kit

The following EMD Chemicals Inc. SpillSolv® absorbent is recommended for this product: SX1330 Solvent Treatment Kit

Section 7. Handling and Storage

Handling

Keep away from heat, sparks and flame. Keep container closed. Do not ingest. Do not get in eyes, on skin, or on clothing. Avoid breathing vapors or spray mists.

Storage

Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection

Eyes Splash goggles.

Body Lab coat.

Respiratory Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Hands Gloves.

Feet Not applicable.

Protective Clothing (Pictograms)

Personal Protection

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product Name

P-XYLENE

Exposure Limits

ACGIH (United States, 1996).
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TWA: 434 mg/m³
STEL: 651 mg/m³
TWA: 6543210.0123456 Nothing
STEL: 6543210.0123456 Nothing

NIOSH
TWA: 6543210.0123456 Nothing
STEL: 6543210.0123456 Nothing
N–Arbeidstilsynet (Norway, 1996). Skin
AN: 108 mg/m³
AUVA (Austria, 1995).
MAK: 440 mg/m³
Spitzenbegrenzung: 880 mg/m³
DK–Arbejdstilsynet (Denmark, 1996). Skin
GV: 109 mg/m³
NIOSH REL (United States, 1994).
STEL: 655 mg/m³
STEL: 150 ppm
TWA: 435 mg/m³ Period: 10 hour(s).
TWA: 100 ppm Period: 10 hour(s).
Arbejdstilsynet (Denmark, 1996). Skin
GV: 109 mg/m³
GV: 25 ppm
Tyterveyslaitos (Finland, 1998). Skin
STEL: 660 mg/m³
STEL: 150 ppm
TWA: 440 mg/m³
TWA: 100 ppm
STEL: 655 mg/m³
STEL: 150 ppm
TWA: 435 mg/m³
TWA: 100 ppm
Secretary of Work and Social security (MX, 1994).
CCT: 655 mg/m³ Period: 15 minute(s).
CCT: 150 ppm Period: 15 minute(s).
CPT: 435 mg/m³ Period: 8 hour(s).
CPT: 100 ppm Period: 8 hour(s).
Nationale MAC–lijst (Netherlands, 2000).
TGG 8 uur: 210 mg/m³
TGG 8 uur: 50 ppm
NZ OSH (NZ, 1994).
STEL: 655 mg/m³
STEL: 150 ppm
TWA: 350 mg/m³
TWA: 80 ppm
ACGIH TLV (United States, 2000).
STEL: 651 mg/m³
STEL: 150 ppm
TWA: 434 mg/m³
TWA: 100 ppm
Xylene, For Histology and Cytology

AUVA (Austria, 1995).
Spitzenbegrenzung: 880 mg/m³ 4 times per shift, Period: 30 minute(s).
Spitzenbegrenzung: 200 ppm 4 times per shift, Period: 30 minute(s).
MAK: 440 mg/m³
MAK: 100 ppm
DK–Arbejdstyldsinet (Denmark, 1996). Skin
GV: 109 mg/m³
GV: 25 ppm
N–Arbeidstyldsinet (Norway, 1996). Skin
AN: 108 mg/m³
AN: 25 ppm
ACGIH (United States, 1996).
STEL: 651 mg/m³
STEL: 150 ppm
TWA: 434 mg/m³
TWA: 100 ppm
NIOSH REL (United States, 1994).
STEL: 655 mg/m³
STEL: 150 ppm
TWA: 435 mg/m³ Period: 10 hour(s).
TWA: 100 ppm Period: 10 hour(s).
AUVA (Austria, 1995).
Spitzenbegrenzung: 880 mg/m³ 4 times per shift, Period: 30 minute(s).
Spitzenbegrenzung: 200 ppm 4 times per shift, Period: 30 minute(s).
MAK: 440 mg/m³
MAK: 100 ppm
DK–Arbejdstyldsinet (Denmark, 1996). Skin
GV: 109 mg/m³
GV: 25 ppm
N–Arbeidstyldsinet (Norway, 1996). Skin
AN: 108 mg/m³
AN: 25 ppm
ACGIH (United States, 1996).
STEL: 651 mg/m³
STEL: 150 ppm
TWA: 434 mg/m³
TWA: 100 ppm
NIOSH REL (United States, 1994).
STEL: 655 mg/m³
STEL: 150 ppm
TWA: 435 mg/m³ Period: 10 hour(s).
TWA: 100 ppm Period: 10 hour(s).
AUVA (Austria, 1995). Skin
Spitzenbegrenzung: 880 mg/m³ 8 times per shift, Period: 5 minute(s).
Spitzenbegrenzung: 200 ppm 8 times per shift, Period: 5 minute(s).
Xylene, For Histology and Cytology

MAK: 440 mg/m3
MAK: 100 ppm

Belgium Minister of Labour (Belgium, 1998).
VCD: 551 mg/m3
VCD: 125 ppm
VL: 440 mg/m3
VL: 100 ppm

BAUA (Germany, 1997). Skin
Spitzenbegrenzung: 440 mg/m3
Spitzenbegrenzung: 100 ppm
MAK: 440 mg/m3
MAK: 100 ppm

DK–Arbejdstyssinet (Denmark, 1996).
GV: 217 mg/m3
GV: 50 ppm

Työterveyslaitos (Finland, 1998).
TWA: 220 mg/m3
TWA: 50 ppm

INRS (France, 1996).
VME: 435 mg/m3
VME: 100 ppm

National Authority for Occupational Safety/Health (Ireland, 1999).
STEL: 545 mg/m3
STEL: 125 ppm
OEL: 435 mg/m3
OEL: 100 ppm

Arbeidsinspectie (Netherlands, 1999). Skin
TGG 8 uur: 215 mg/m3
TGG 8 uur: 50 ppm

N–Arbeidstyssinet (Norway, 1996).
AN: 220 mg/m3
AN: 50 ppm

AFS (Sweden, 1996).
KTV: 450 mg/m3
KTV: 100 ppm
NGV: 200 mg/m3
NGV: 50 ppm

EH40–OES (United Kingdom (UK), 1997).
STEL: 552 mg/m3
STEL: 125 ppm
TWA: 441 mg/m3
TWA: 100 ppm

ACGIH (United States, 1994).
STEL: 543 mg/m3
STEL: 125 ppm
TWA: 434 mg/m3
TWA: 100 ppm

NIOSH REL (United States, 1994).
STEL: 545 mg/m3
STEL: 125 ppm
Section 9. Physical and Chemical Properties

**Odor**
Aromatic.

**Color**
Colorless.

**Physical State and Appearance**
Liquid.

**Molecular Weight**
Not applicable.

**Molecular Formula**
Not applicable.

**pH**
Not available.

**Boiling/Condensation Point**
The lowest known value is 136.1°C (277°F) (ETHYL BENZENE).

**Melting/Freezing Point**
May start to solidify at 13.35°C (56°F) based on data for: P–XYLENE.

**Critical Temperature**
The lowest known value is 343.1°C (649.6°F) (P–XYLENE).

**Specific Gravity**
Weighted average: 0.87 (Water = 1)

**Vapor Pressure**
Not available.

**Vapor Density**
The highest known value is 3.7 (Air = 1) (O–XYLENE). Weighted average: 3.68 (Air = 1)

**Odor Threshold**
The highest known value is 0.05 ppm (P–XYLENE) Weighted average: 0.05 ppm

**Evaporation Rate**
The highest known value is 0.84 (ETHYL BENZENE) Weighted average: 0.7 compared to (n–BUTYL ACETATE = 1)

**LogKow**
Not available.

**Solubility**
Very slightly soluble in water.

Section 10. Stability and Reactivity

**Stability and Reactivity**
The product is stable.

**Conditions of Instability**
Not available.

**Incompatibility with Various Substances**
Highly reactive with oxidizing agents. Reactive with acids, alkalis.

**Rem/Incompatibility**
Incompatible with some strong acids. (P–XYLENE)

**Hazardous Decomposition Products**
Not available.

**Hazardous Polymerization**
Will not occur.

Section 11. Toxicological Information

**RTECS Number:**
p–Xylene ZE2625000
Xylene, For Histology and Cytology

m-Xylene ZE2275000
o-Xylene ZE2450000
Ethylbenzene DA0700000

Toxicity
Acute oral toxicity (LD50): 3500 mg/kg [Rat]. (ETHYL BENZENE).

Chronic Effects on Humans
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC [ETHYL BENZENE].

Acute Effects on Humans
Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching. Hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. May be hazardous in case of skin contact (permeator). Hazardous in case of inhalation (lung irritant). Extremely hazardous in case of ingestion. May be fatal if swallowed.

Synergetic Products Not available.
(Toxicologically)

Irritancy
Draize Test: Not available.

Sensitization
Not available.

Carcinogenic Effects
Classified 2B (Possible for human.) by IARC [ETHYL BENZENE].

Toxicity to Reproductive System
Not available.

Teratogenic Effects Not available.

Mutagenic Effects Not available.

Section 12. Ecological Information
Ecotoxicity
Not available.

BOD5 and COD
Not available.

Toxicity of the Products of Biodegradation
The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations
EPA Waste Number D001 U239

Treatment
Incineration, fuels blending or recycle. Contact your local permitted waste disposal site (TSD) for permissible treatment sites. Always contact a permitted waste disposal (TSD) to assure compliance with all current local, state, and Federal Regulations.

Section 14. Transport Information
DOT Classification Not available.

TDG Classification Not available.

IMO/IMDG Classification Not available.

ICAO/IATA Classification Not available.

Section 15. Regulatory Information
U.S. Federal Regulations
TSCA 8(a) PAIR: P–XYLENE
TSCA 8(b) inventory: P–XYLENE; M–XYLENE; O–XYLENE; ETHYL
Xylene, For Histology and Cytology

BENZENE
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: P–XYLENE; M–XYLENE; O–XYLENE; ETHYL BENZENE
SARA 313 toxic chemical notification and release reporting: P–XYLENE 18%; M–XYLENE 42%; O–XYLENE 19%; ETHYL BENZENE 21%
Clean Water Act (CWA) 307: ETHYL BENZENE
Clean Water Act (CWA) 311: P–XYLENE; M–XYLENE; O–XYLENE; ETHYL BENZENE
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.

WHMIS (Canada) 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).
CEPA DSL: P–XYLENE; M–XYLENE; O–XYLENE; ETHYL BENZENE
This product has been classified in accordance with the hazard criteria of the Controlled Product Regulations and the MSDS contains all required information.

International Regulations EINECS P–XYLENE 203–396–5
M–XYLENE 203–576–3
O–XYLENE 202–422–2
ETHYL BENZENE 202–849–4
DSCL (EEC) R10– Flammable.
R20/21- Harmful by inhalation and in contact with skin.
R38– Irritating to skin.
International Lists Australia (NICNAS): P–XYLENE; M–XYLENE; O–XYLENE; ETHYL BENZENE
Germany water class: P–XYLENE
Japan (MITI): P–XYLENE; M–XYLENE; O–XYLENE; ETHYL
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BENZENE

Korea (TCCL): P–XYLENE; M–XYLENE; O–XYLENE; ETHYL BENZENE

Philippines (RA6969): P–XYLENE; M–XYLENE; O–XYLENE; ETHYL BENZENE

China: No products were found.

State Regulations

Pennsylvania RTK: P–XYLENE: (environmental hazard, generic environmental hazard); M–XYLENE: (environmental hazard, generic environmental hazard); O–XYLENE: (environmental hazard, generic environmental hazard); ETHYL BENZENE: (environmental hazard, generic environmental hazard)

Massachusetts RTK: P–XYLENE; M–XYLENE; O–XYLENE; ETHYL BENZENE

New Jersey: P–XYLENE; M–XYLENE; O–XYLENE; ETHYL BENZENE

California prop. 65: No products were found.

Section 16. Other Information

<table>
<thead>
<tr>
<th>National Fire Protection Association (U.S.A.)</th>
<th>3</th>
<th>Fire Hazard</th>
<th>20</th>
<th>Health Reactivity</th>
</tr>
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</table>

Other Special Considerations

Xylenes is also assigned the CAS# 1330–20–7.

Revision

Notice to Reader

The statements contained herein are based upon technical data that EMD Chemicals Inc. believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EMD CHEMICALS INC. MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.