MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
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Gaithersburg, Maryland 20899-2300

SRM Number: 3004
MSDS Number: 3004
SRM Name: *m*-Xylene in Methanol

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Description: This Standard Reference Material (SRM) is a gravimetrically prepared single-compound solution (*m*-xylene) in methanol intended primarily for the calibration of instrumentation and validation of methods for volatile organic compound (VOC) determinations. A unit of SRM 3004 consists of two 5 mL sealed borosilicate glass ampoules of a gravimetrically prepared solution of *m*-xylene in methanol. Approximately 2.5 mL of this mixture is supplied in each 5 mL glass ampoule.

Substance: *m*-Xylene in Methanol.

Other Designations:

Methanol (methyl alcohol; methyl hydroxide; wood alcohol; wood spirit).

m-Xylene (1,3-Dimethylbenzene; *m*-dimethylbenzene; *m*-methyltoluene; 1,3-xylene).

2. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 2 Fire = 3 Reactivity = 0

NOTE: This *m*-xylene in methanol solution has not been tested as a whole. The health and physical hazard information are for *m*-xylene and methanol. The actual effects of the solution may differ from the individual components.

Major Health Hazards: Skin, eye, and respiratory tract irritation, central nervous system depression, nerve damage, aspiration hazard.

Physical Hazards: Flammable liquid and vapor. Vapor may cause flash fire. Electrostatic charges may be generated by flow or agitation.

Potential Health Effects (Acute and Chronic):

Inhalation: Methanol may cause irritation, cough, ringing in the ears, constipation, headache, drowsiness, dizziness, tingling sensation, pain in extremities, tremors, loss of coordination, blood disorders, and nerve damage. *m*-Xylene may cause respiratory tract irritation with difficulty breathing. Other symptoms of exposure may include transient euphoria, headache, nausea, vomiting, abdominal pain, dizziness, ataxia, and staggering.

Skin Contact: Methanol can cause irritation, absorption may occur, headache, drowsiness, dizziness, loss of coordination, and blood disorders. *m*-Xylene may cause irritation and defatting of the skin.

Eye Contact: Vapors may cause irritation and eye damage. Repeated or prolonged contact may cause conjunctivitis. *m*-Xylene may cause irritation, possibly severe.

Ingestion: Ingestion of methanol may result in mild and transient inebriation, and subsequent drowsiness. Liver, kidney, heart, stomach, intestine and pancreatic damage may also occur. Death may occur due to respiratory failure. As little as 15 mL has caused blindness; the usual fatal dose is 60–240 mL. Ingestion of *m*-xylene may cause a burning sensation in the mouth and stomach, severe gastrointestinal distress, and central nervous system depression. *m*-Xylene poses an aspiration hazard.

Listed as a Carcinogen/Potential Carcinogen

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component	CAS Number	EC Number (EINECS)	Nominal Mass Concentration[(a)] (%)
Methanol	67-56-1	200-659-6	99
m-Xylene	108-38-3	203-576-3	1

[(a)] Hazardous components 1 % or greater; carcinogens 0.1 % or greater are listed in compliance with OSHA 29 CFR 1910.1200.

Component: Methanol

EC Classification: T, F
EC Risk (R No.): 11, 23/24/25, 39/23/24/25
EC Safety (S No.): 7, 16, 36/37, 45

Component: *m*-Xylene

EC Classification: Xn
EC Risk (R No.): 10, 20/21, 38
EC Safety (S No.): 25

EC Risk/Safety Phrases: See Section 15, "Regulatory Information".

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek medical attention if needed.

Eye Contact: Immediately flush eyes with copious amounts of water for at least 15 minutes.

Skin Contact: Wash exposed skin with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Ingestion: Ingestion of this material is not likely under normal conditions of use. Potential aspiration hazard if ingested. If swallowed, seek medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Severe fire hazard. Vapor/air mixtures are explosive. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

Extinguishing Media: Alcohol-resistant foam, carbon dioxide, regular dry chemical, water.

Fire Fighting: Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Note: The data listed below is for methanol.

Flash Point (°C): 11 (52 ºF)

Method Used: Closed Cup

Autoignition Temp. (°C): 385 (725 ºF)

Flammability Limits in Air
UPPER (Volume %): 36
LOWER (Volume %): 6

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Remove sources of ignition. Do not touch spilled material. Absorb small spills with sand or other non-combustible material. Collect spilled material in appropriate container for proper disposal.

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage: Store and handle in accordance with all current regulations and standards. Sealed ampoules should be stored in the dark at temperatures between 10 °C and 30 °C. Grounding and bonding required. Keep separated from incompatible substances. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106.

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits

Component: Methanol

OSHA (PEL): 200 ppm, 260 mg/m^3 (TWA)
ACGIH (TLV): 200 ppm (TWA); 250 ppm (STEL);
Skin – potential significant contribution to overall exposure by the cutaneous route
NIOSH: 200 ppm, 260 mg/m^3 (TWA); 250 ppm, 325 mg/m^3 (STEL); 6000 ppm (IDLH);
Potential for dermal absorption.

Component: *m*-Xylene

OSHA (PEL): Not listed.
ACGIH (TLV): 100 ppm (TWA); 150 ppm (STEL)
NIOSH: 100 ppm (TWA); 150 ppm (STEL); 900 ppm (IDLH)

Ventilation: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Respirator: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29 CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye Protection: Wear safety goggles. An eyewash station and drench shower should be readily available near the handling and use areas.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component	Methanol	*m*-Xylene
Appearance and Odor	clear and colorless liquid, alcohol odor (threshold 100 ppm)	clear and colorless liquid, sweet odor (threshold 3.7 ppm)
Molecular Formula	CH_3OH	C_8H_{10}
Molar Mass (g/mol)	32.04	106.17
Density (g/cm^3)	0.79	Not available
Vapor Density (air = 1)	1.11	3.7
Specific Gravity (water = 1)	0.79	0.86
Kinematic Viscosity	0.59 cP 20 °C	Not available
Boiling Point (°C)	65 (149 °F)	139 (282 °F)
Melting Point (°C)	–94 (–137 °F)	–48 (–54 °F)
Water Solubility	soluble	insoluble
Solvent Solubility	acetone, alcohol, benzene, chloroform, ethanol, ether, ketones, organic solvents	acetone, alcohol, benzene, ether, organic solvents

NOTE: The physical and chemical data provided are for the pure components. No physical or chemical data are available for the solution of *m*-xylene in methanol. The actual behavior of the solution may differ from the individual components.

10. STABILITY AND REACTIVITY

Stability: X Stable _____ Unstable

Conditions to Avoid: Avoid heat, flames, sparks, and other sources of ignition. Ampoules may rupture or explode if exposed to heat. Keep out of water supplies and sewers. Avoid inhalation of material or combustion by-products. Avoid contact with incompatible materials.

Incompatible Materials: Halo carbons, combustible materials, metals, oxidizing materials, halogens, metal carbide, bases, acids, amines, and metal salts.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Oxides of carbon, various organic fragments.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: X Inhalation X Skin X Ingestion

Toxicity Data: End points listed by Registry of Toxic Effects of Chemical Substances (RTECS).

Component: Methanol
Rat, Oral LD_{50}: 5628 mg/kg
Rabbit, Skin LD_{50}: 15 800 mg/kg
Rat, Inhalation LC_{50}: 83.2 mg/L (4 h); 64 000 ppm (4 h)

Component: *m*-Xylene
Rat, Oral LD_{50}: 4988 mg/kg
Mouse, Inhalation LC_{50}: 5267 ppm (6 h)

Irritation Data:

Component: Methanol
Rabbit, eyes: 100 mg/24 h, moderate
Rabbit, skin: 20 mg/24 h, moderate

Component: *m*-Xylene
Rabbit, eyes: 5 mg/24 h, severe
Rabbit, skin: 20 mg/24 h, moderate

Health Effects: See Section 2, "Hazards Identification" for potential health effects.

Target Organs: Eyes, skin, respiratory tract, central nervous system.

Medical Conditions Aggravated by Exposure: Allergies and disorders of the blood system, immune system, eye, skin, and kidney.

Mutagen/Teratogen: The components of this material have been reviewed and the Registry of Toxic Effects of Chemical Substances (RTECS) publishes the following endpoints.

Component: Methanol
Tumorigenic: Rat, Inhalation TCLo: 1000 ppm (2 years)
Mutagenic: Human: 300 mmol/L
Reproductive: Mouse, Inhalation TCLo: 2000 ppm (pregnant 6–15 d)

Component: *m*-Xylene
Tumorigenic: No data listed.
Mutagenic: Human, 0.34 mmol/L (1 h)
Reproductive: Mouse, Inhalation TCLo: 500 mg/m^3 (12 h, pregnant 6-15 d)

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Component: Methanol
Fish Toxicity: Rainbow trout (*Oncorhynchus mykiss*) LC_{50} (static): 18–20 mL/L (96 h)
Component: *m*-Xylene
Rainbow trout (*Oncorhynchus mykiss*) LC_{50} (semi-static): 8.4 mg/L (96 h)

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local requirements. Subject to disposal regulations: U.S. EPA 40 CFR 262; Hazardous Waste Number(s): U154 (methanol)

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN1230, Methanol solution, Hazard Class 3 (6.1), Packing Group II, Excepted Qty: Yes, E2.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): 5000 lb (2270 kg) final RQ for methanol;
1000 lb (454 kg) final RQ for *m*-xylene.
SARA Title III Section 302 (40 CFR 355.30): Not regulated.
SARA Title III Section 304 (40 CFR 355.40): Not regulated.
SARA Title III Section 313 (40 CFR 372.65): Methanol de minimis concentration 1.0 %; *m*-Xylene de minimis concentration 1.0 %.
OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21)

ACUTE HEALTH:	Yes
CHRONIC HEALTH:	Yes
FIRE:	Yes
REACTIVE:	No
PRESSURE:	No

STATE REGULATIONS

California Proposition 65: WARNING! This product contains a chemical (methanol) known to the state of California to cause reproductive/developmental effects. Keep out of water supplies and sewers.

CANADIAN REGULATIONS

WHMIS Information: Not provided for this material.

EUROPEAN REGULATIONS

Component: Methanol

EC Classification: F – Highly Flammable, T – Toxic (Concentration ≥20 %)

EC Risk Phrases:
R11 – Highly flammable.
R23/24/25 – Toxic by inhalation, in contact with skin and if swallowed.
R39/23/24/25 – Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.

EC Safety Phrases:
S7 – Keep container tightly closed.
S16 – Keep away from sources of ignition – No smoking.
S36/37 – Wear suitable protective clothing and gloves.
S45 – In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Component: *m*-Xylene

EC Classification: Xn – Harmful

EC Risk Phrases:
R10 – Flammable.
R20/21 – Harmful by inhalation and in contact with skin.
R38 – Irritating to skin.

EC Safety Phrases:
S25 – Avoid contact with eyes.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Methanol and *m*-xylene are listed.

TSCA 12(b), Export Notification: Not listed.

16. OTHER INFORMATION

Sources: ChemADVISOR, Inc., MSDS *Methanol*, 03 December 2012.

ChemADVISOR, Inc., MSDS *m-Xylene*, 03 December 2012.

EC; European Chemical Substance Information System (ESIS), *m-Xylene*, CAS No. 108-38-3; available at http://esis.jrc.ec.europa.eu/ (accessed Feb 2013).

EC; ESIS, *Methanol*, CAS No. 67-56-1; available at http://esis.jrc.ec.europa.eu/ (accessed Feb 2013).