

## SAFETY DATA SHEET

### 1. SUBSTANCE AND SOURCE IDENTIFICATION

#### Product Identifier

**SRM Number:** 870  
**SRM Name:** Column Performance Test Mixture for Liquid Chromatography  
**Other Means of Identification:** Not applicable.

#### Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is a mixture of five organic compounds in methanol and is intended for use in characterizing general aspects of liquid chromatographic (LC) column performance, including efficiency, void volume, methylene selectivity, retentiveness, and activity toward chelators and organic bases. SRM 870 consists of a mixture of the following five organic compounds in methanol: uracil, toluene, ethyl benzene, quinizarin, and amitriptyline. A unit of SRM 870 consists of five ampoules each containing approximately 1.1 mL of the mixture.

#### Company Information

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

Telephone: 301-975-2200  
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 1-800-424-9300 (North America)  
 +1-703-527-3887 (International)

### 2. HAZARDS IDENTIFICATION

#### Classification

**Physical Hazard:** Flammable liquid, Category 2  
**Health Hazard:** Acute toxicity, Oral, Category 3  
 Acute toxicity, Inhalation, Category 3  
 Acute toxicity, Dermal, Category 3  
 Carcinogenicity, Category 2  
 Specific target organ toxicity, – Single Exposure, Category 1

#### Label Elements

##### Symbol



##### Signal Word

Danger

##### Hazard Statement(s)

H225 Highly flammable liquid and vapor.  
 H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.  
 H351 Suspected of causing lung cancer.  
 H370 Causes damage to eyes, kidney, liver, heart, and central nervous system.

##### Precautionary Statement(s)

P201 Obtain special instructions before use.  
 P202 Do not handle until all safety precautions have been read and understood.  
 P210 Keep away from heat, sparks, open flames, and hot surfaces. — No smoking.  
 P233 Keep container tightly closed.

P241	Use explosion-proof electrical, ventilating, and lighting equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe mist, vapors, or spray.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves, eye protection, and protective clothing.
P301+P310	If swallowed: Immediately call a doctor.
P308+P311	If exposed or concerned: Call a doctor.
P330	Rinse mouth.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents and container according to local regulations programs.

**Hazards Not Otherwise Classified:** None.

**Ingredients(s) with Unknown Acute Toxicity:** None.

### 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

**Substance:** Methanol with trace amount of organic components.

**Other Designations**

Methanol (Methyl alcohol; wood alcohol; methyl hydroxide; wood spirit; wood naphtha),  
 Amitriptyline hydrochloride [1-Propanamine, 3-(10,11-dihydro-5H-dibenzo(a,d)cyclohepten-5-ylidene)-N,N-dimethyl-, hydrochloride; Amitriptyline HCl],  
 Ethyl benzene (phenylethane; ethylbenzene; ethylbenzol; alpha-methyltoluene),  
 Quinizarin (1,4-Dihydroxy-9,10-anthracenedione),  
 Toluene (methylbenzene; methylbenzol; phenylmethane; toluol; toulene),  
 Uracil [2,4(1H,3H)-Pyrimidinedione; 2,4-Dihydroxypyrimidine]

Components are listed in compliance with OSHA's 29 CFR 1910.1200. Uracil and quinizarin are below the reporting limit for OSHA and listed here for informational purposes only. The actual values for this material are given in the NIST Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Methanol	67-56-1	200-659-6	>99.1
Amitriptyline hydrochloride	549-18-8	208-964-6	0.27
Ethyl benzene	100-41-4	202-849-4	0.17
Toluene	108-88-3	203-625-9	0.14
Uracil	66-22-8	200-621-9	<0.01
Quinizarin (1,4-Dihydroxy-9,10-anthracenedione)	81-64-1	201-368-7	<0.01

### 4. FIRST AID MEASURES

**Description of First Aid Measures**

**Inhalation:** If adverse effects occur, remove to well-ventilated (uncontaminated) area. If breathing is difficult, qualified personnel may administer oxygen. If not breathing, qualified personnel should give artificial respiration. Seek immediate medical attention.

**Skin Contact:** Rinse affected skin with water for at least 15 minutes, then wash thoroughly with soap or mild detergent and water. If skin irritation persists, seek medical aid and bring the container or label.

**Eye Contact:** Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

**Ingestion:** If ingested, seek medical attention.

**Most Important Symptoms/Effects, Acute and Delayed:** Irritation, dizziness, tingling sensation, pain in extremities, tremors, loss of coordination, difficulty breathing, irregular heartbeat, visual disturbances, blindness, bluish skin color, convulsions, unconsciousness, and coma.

**Indication of any immediate medical attention and special treatment needed, if necessary:** If any of the above symptoms are present, seek immediate medical attention.

## 5. FIRE FIGHTING MEASURES

**Fire and Explosion Hazards:** Severe fire hazard. Vapor/air mixtures are explosive above the flash point. Vapors or gases may ignite at distant ignition sources and flash back. See Section 9, “Physical and Chemical Properties” for flammability properties.

### Extinguishing Media

Suitable: Regular dry chemical, carbon dioxide, water, or alcohol-resistant foam.

Unsuitable: None listed.

**Specific Hazards Arising from the Chemical:** Not applicable.

**Special Protective Equipment and Precautions for Fire-Fighters:** Move container from fire area if it can be done without personal risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

**NFPA Ratings** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 2                      Fire = 3                      Reactivity = 0

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions, Protective Equipment and Emergency Procedures:** Use suitable protective equipment; see Section 8, “Exposure Controls and Personal Protection”. Keep out of waters supplies and sewers.

**Methods and Materials for Containment and Clean up:** Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk, with water spray to reduce vapors. Absorb spilled material with sand or non-combustible material and collect in appropriate container for disposal.

## 7. HANDLING AND STORAGE

**Safe Handling Precautions:** See Section 8, “Exposure Controls and Personal Protection”.

**Storage and Incompatible Materials:** Store in a well-ventilated area. Keep separated from incompatible substances (see Section 10, “Stability and Reactivity”).

## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits			
Components	OSHA (PEL)	ACGIH (TLV)	NIOSH (REL)
Methanol	260 mg/m <sup>3</sup> (200 ppm) TWA	200 ppm TWA 250 ppm STEL Skin – potential significant contribution to overall exposure by the cutaneous route.	260 mg/m <sup>3</sup> ; 200 ppm TWA 325 mg/m <sup>3</sup> ; 250 ppm STEL 6000 ppm IDLH Potential for dermal absorption.
Ethyl benzene	435 mg/m <sup>3</sup> (100 ppm) TWA	20 TWA ppm	435 mg/m <sup>3</sup> (100 ppm) TWA 545 mg/m <sup>3</sup> (125 ppm) STEL 800 ppm IDLH (10 % LEL)
Toluene	200 ppm TWA 300 ppm Ceiling	20 TWA ppm	375 mg/m <sup>3</sup> (100 ppm) TWA 560 mg/m <sup>3</sup> (150 ppm) STEL

**NOTE:** No occupational exposure limits for amitriptyline HCl, quinizarin, and uracil.

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

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

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

**Eye Protection:** Splash resistant safety goggles and emergency eyewash are recommended.

**Skin and Body Protection:** Chemical resistant clothing and gloves are recommended.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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<b>Descriptive Properties</b>	Methanol >99.1 %
<b>Molar Mass (g/mol)</b>	32.04
<b>Molecular Formula</b>	CH <sub>3</sub> OH
<b>Appearance (physical state, color, etc.)</b>	clear, colorless liquid
<b>Odor</b>	alcohol odor
<b>Odor threshold</b>	100 ppm
<b>pH</b>	not available
<b>Evaporation rate (butyl acetate = 1)</b>	4.6
<b>Melting point/freezing point</b>	-94 °C (-137 °F)
<b>Relative Density as Specific Gravity (water = 1)</b>	0.7914
<b>Density</b>	not available
<b>Vapor Pressure</b>	97.25 mmHg at 20 °C
<b>Vapor Density (air = 1)</b>	1.11
<b>Viscosity</b>	0.59 cP at 20 °C
<b>Solubilities</b>	soluble in water, ether, benzene, ethanol, acetone, chloroform, ketones, organic solvents
<b>Partition coefficient (n-octanol/water)</b>	not available
<b>Thermal Stability Properties</b>	
<b>Autoignition Temperature</b>	385 °C (725 °F)
<b>Thermal Decomposition</b>	not available
<b>Initial boiling point and boiling range</b>	65 °C (149 °F)
<b>Explosive Limits, LEL (Volume %)</b>	6 %
<b>Explosive Limits, UEL (Volume %)</b>	36 %
<b>Flash Point (Closed Cup)</b>	11 °C (51.8 °F)
<b>Flammability (solid, gas)</b>	not applicable

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** Stable at normal temperatures and pressure.

**Stability:**  Stable  Unstable

**Possible Hazardous Reactions:** Not applicable.

**Conditions to Avoid:** Avoid heat, flames, sparks, and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

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

**Hazardous Decomposition:** Oxides of carbon.

**Hazardous Polymerization:**  Will Occur  Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Exposure:**      X   Inhalation          X   Skin                      X   Ingestion

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** Skin irritation, eye irritation, central nervous system depression, and nerve damage. May cause blindness.

### Potential Health Effects (Acute, Chronic, and Delayed)

**Inhalation:** Acute and chronic exposure 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. Chronic exposure may also cause sensitivity to light, changes in blood pressure, digestive issues, difficulty breathing, irregular heartbeat, visual disturbances, blindness, bluish skin color, lung congestion, heart damage, kidney damage, liver damage, reproductive effects, effects on the brain, convulsions, unconsciousness, and coma.

**Skin Contact:** Acute and chronic exposure may result in irritation, absorption may occur, headache, drowsiness, loss of coordination, blood disorders, and nerve damage.

**Eye Contact:** Acute and chronic exposure may cause irritation.

**Ingestion:** Acute and chronic exposure may cause the same effects as listed for inhalation.

### Numerical Measures of Toxicity

**Acute Toxicity:** Category 3 for oral, inhalation, and dermal.

Methanol, Human, Oral, LDLo: 143 mg/kg

Oral, LD50: 5600 mg/kg

Inhalation, LC50: 83.2 mg/L (4 h); 145 000 ppm (1 h); 64 000 ppm (4 h)

Rabbit, Dermal, LD50: 15 800 mg/kg

Ethyl benzene, Rat, Oral, LD50: 3500 mg/kg

Inhalation, LC50: 17.2 mg/L (4 h)

Rabbit, Dermal LD50: 15 400 mg/kg

**Skin Corrosion/Irritation:** Not classified.

Methanol, Rabbit, Skin: 20 mg (24 h) – moderate

Ethyl benzene, Rabbit, Open skin: 15 mg (24 h) – mild

**Serious Eye Damage/Irritation:** Not classified.

Methanol, Rabbit, eyes: 100 mg (24 h) moderate; 40 mg moderate

Ethyl benzene, Rabbit, eyes: 500 mg severe

**Respiratory Sensitization:** Not classified; no data available.

**Skin Sensitization:** Not classified; no data available.

**Germ Cell Mutagenicity:** Not classified; no data available.

**Carcinogenicity:** Category 2

**Listed as a Carcinogen/Potential Carcinogen**                      X   Yes                    \_\_\_\_\_ No

Methanol and amitriptyline hydrochloride are not listed by IARC, NTP, or OSHA as a carcinogen/potential carcinogen.

Ethyl benzene is listed as Group 2b, (*possibly carcinogenic to humans*) by IARC. Ethyl benzene is not listed by NTP or OSHA as a carcinogen/potential carcinogen.

Toluene is listed a Group 3 (*not classifiable*) by IARC. Toluene is not listed by NTP or OSHA as a carcinogen/potential carcinogen.

Tumorigenic: Methanol, Rat, Inhalation, TClO: 1000 ppm (2 years)

Ethylbenzene, Rat, Inhalation TClO: 750 ppm (1 week)

Mutagenic: Methanol, Mouse, Oral TD: 1 g/kg (cytogenetic analysis)

Rat, Oral TD: 10 µmol/kg (DNA damage)

Human, lymphocyte TC: 300 mmol/L (DNA inhibition)

Ethyl benzene, Human, lymphocyte TC: 10 mmol/L (sister chromatid exchange)

**Reproductive Toxicity:** Not classified.

Ethyl benzene, Rat, Inhalation, TClO: 600 mg/m<sup>3</sup> (24 h, pregnant 7 d to 15 d)

Rat, Inhalation, TClO: 96 ppm (7 h, pregnant 1 d to 19 d)

**Specific Target Organ Toxicity, Single Exposure:** Category 1

Damage to eyes, kidney, liver, heart, central nervous system.

**Specific Target Organ Toxicity, Repeated Exposure:** Not classified; no data available.

**Aspiration hazard:** Not applicable.

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## 12. ECOLOGICAL INFORMATION

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### Ecotoxicity Data

#### Aquatic Toxicity

Methanol, Fish, Bluegill (*Lepomis macrochirus*), LC50: 13 500 mg/L to 17 600 mg/L, (96 h) flow-through

Fish, Fathead minnow (*Pimephales promelas*), LC50: 28 200 mg/ L (96 h) flow-through

Fish, Fathead minnow (*Pimephales promelas*), LC50: >100 mg/L (96 h) static

Ethyl benzene, Fish, Fathead minnow (*Pimephales promelas*), LC50: 7.55-11 mg/L (96 h) flow-through

Fish, Fathead minnow (*Pimephales promelas*), LC50: 9.1-15.6 mg/L (96 h) static

**Persistence and Degradability:** No data available.

**Bioaccumulative Potential:** <10 species: fish (Methanol).

**Mobility in Soil:** No data available.

**Other Adverse effects:** No data available.

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## 13. DISPOSAL CONSIDERATIONS

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**Waste Disposal:** Dispose in accordance with all applicable federal, state, and local regulations.

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## 14. TRANSPORTATION INFORMATION

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

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## 15. REGULATORY INFORMATION

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### U.S. Regulations

CERCLA Sections 102a/103 (40 CFR 302.4): Methanol, 5000 lbs (2270 kg) final RQ.

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): 1.0 % de minimis concentrations for methanol.

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 known to the state of California to cause reproductive/developmental effects (methanol) and cancer (ethyl benzene).

**U.S. TSCA Inventory:** Methanol, uracil, toluene, ethyl benzene, quinizarin, and amitriptyline HCl are listed.

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

**Canadian Regulations:** WHMIS Information is not provided for this material.

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## 16. OTHER INFORMATION

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**Issue Date:** 05 July 2016

**Sources:** ChemADVISOR, Inc., SDS *Methyl Alcohol*, 09 December 2015.

ChemADVISOR, Inc., SDS *Ethyl Benzene*, 09 December 2015.

ChemADVISOR, Inc., SDS *Toluene*, 09 December 2015.

ChemIDplus Advanced; US National Library of Medicine, *Amitriptyline hydrochloride*, CAS No. 549-18-8, available at <http://chem.sis.nlm.nih.gov/chemidplus/> (accessed July 2016).

ChemIDplus Advanced; US National Library of Medicine, *1,4-Dihydroxy-9,10-anthracenedione*, CAS No. 81-64-1, available at <http://chem.sis.nlm.nih.gov/chemidplus/> (accessed July 2016).

ChemIDplus Advanced; US National Library of Medicine, *Uracil*, CAS No. 66-22-8, available at <http://chem.sis.nlm.nih.gov/chemidplus/> (accessed July 2016).

CDC, NIOSH, *Methanol*, RTECS# PC1400000, CAS No. 67-56-1; available at <http://www.cdc.gov/niosh-rtecs/PC155CC0.html> (accessed July 2016).

### Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transport Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration	STEL	Short Term Exposure Limit
LD50	Median Lethal Dose or Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System
n.o.s.	Not Otherwise Specified		

**Disclaimer:** Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail [srmmsds@nist.gov](mailto:srmmsds@nist.gov); or via the Internet at <http://www.nist.gov/srm>.