

# MATERIAL SAFETY DATA SHEET

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## 1. SUBSTANCE AND SOURCE IDENTIFICATION

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

SRM Number: 3266  
MSDS Number: 3266  
SRM Name: Hypericin Calibration Solution

Date of Issue: 20 December 2011

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

**Description:** This Standard Reference Material (SRM) is a solution of hypericin in methanol with approximately 1.4 % pyridine. This SRM is intended primarily for calibration of instruments and techniques used for the determination of hypericin. A unit of SRM 3266 consists of five 2 mL ampoules, each containing approximately 1.2 mL of the hypericin solution.

**Substance:** Methanol Solution.

**Other Designations:**

Methanol (Methyl alcohol; wood alcohol; carbinol; monohydroxymethane; wood spirit; wood naphtha; methylol)  
Pyridine (Azine, Azabenzene)

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## 2. HAZARDS IDENTIFICATION

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

**Physical Hazards:** Flammable liquid and vapor. Vapor may cause flash fire.

**Major Health Hazards:** Skin irritation, eye irritation, central nervous system depression, nerve damage.

**Target Organ:** Nervous system.

**Potential Health Effects**

**Inhalation:**

**Component:** Methanol

Acute exposure to methyl alcohol may cause irritation of the mucous membranes, coughing, oppression in the chest, tracheitis, bronchitis, tinnitus, unsteady gait, twitching, colic, constipation, nystagmus, and blepharospasm. Symptoms from occupational exposure include paresthesias, numbness and shooting pains in the hands and forearms. Metabolic acidosis, and effects on the eyes and central nervous system may occur as detailed in acute ingestion. Chronic or prolonged exposure may cause effects as in acute ingestion, reproductive effects have been reported in animals.

**Component:** Pyridine

Low vapor concentrations may cause irritation to the nose and respiratory tract and an unpleasant taste in the mouth. High vapor concentrations may cause narcosis with dizziness, drowsiness, and headache. Prolonged exposure to 6-12 ppm has produced mild symptoms of central nervous system injury. Other effects include vomiting, diarrhea, abdominal discomfort.

**Skin Contact:**

**Component:** Methanol

Contact with methanol may cause irritation. Skin absorption may occur and cause metabolic acidosis and effects on the eyes and central nervous system as detailed in acute ingestion. Repeated or prolonged contact with methanol may cause defatting of the skin resulting in erythema, scaling, and eczematoid dermatitis. Chronic absorption may result in metabolic acidosis and effects as detailed in acute ingestion.

**Component:** Pyridine

Contact with the liquid may cause redness, irritation, and burns. Photosensitivity and sensitization reactions may occur in previously exposed persons. Chronic exposure may cause dermatitis.

**Eye Contact:****Component:** Methanol

Methanol vapors may cause irritation. High concentrations have been reported to cause violent inflammation of the conjunctiva and epithelial defects on the cornea. Mild irritation may occur with dilute solutions. Chronic exposure may cause conjunctivitis.

**Component:** Pyridine

Vapor and liquid may cause irritation and corneal damage. Long term exposure may cause conjunctivitis.

**Ingestion:**

Ingesting methanol may cause mild and transient inebriation and subsequent drowsiness followed by an asymptomatic period lasting 8–48 hours. Following the delay, coughing, dyspnea, headache, dullness, weakness, vertigo or dizziness, nausea, vomiting, occasional diarrhea, anorexia, violent pain in the back, abdomen, and extremities, restlessness, apathy or delirium, and rarely, excitement and mania may occur. As little as 15 ml has caused blindness; the usual fatal dose is 60–240 ml. Prolonged asthenia and irreversible effects on the nervous system including difficulty in speech, motor dysfunction with rigidity, spasticity, and hypokinesia have been reported. Repeated ingestion of methanol may cause visual impairment and blindness and other systemic effects as detailed in acute ingestion. Reproductive effects have been reported in animals.

**Component:** Pyridine

Ingestion in small dose may cause mild anorexia, nausea, fatigue and mental depression. Larger amounts may cause severe vomiting, delirium, pulmonary edema. Chronic ingestion may cause effects as in chronic inhalation. Repeated low level doses may cause cirrhosis.

**Listed as a Carcinogen/Potential Carcinogen****Component: Methanol**

In the National Toxicology Program (NTP) Report on Carcinogens  
 In the International Agency for Research on Cancer (IARC) Monographs  
 By the Occupational Safety and Health Administration (OSHA)

Yes	No
_____	<u>  X  </u>
_____	<u>  X  </u>
_____	<u>  X  </u>

**Component: Pyridine**

In the National Toxicology Program (NTP) Report on Carcinogens  
 In the International Agency for Research on Cancer (IARC) Monographs  
 By the Occupational Safety and Health Administration (OSHA)

Yes	No
_____	<u>  X  </u>
_____	<u>  X  </u>
_____	<u>  X  </u>

**3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS**

Component	CAS Number	EC Number (EINECS)	Nominal Concentration <sup>(a)</sup> (%)
Methanol	67-56-1	200-659-6	>98
Pyridine	110-86-1	203-809-9	1.4

<sup>(a)</sup> Hazardous components 1 % or greater; carcinogens 0.1 % or greater are listed in compliance with OSHA 29 CFR 1910.1200(g)(2)(i)(C)(1).

**Component:** Methanol

**EC Classification:** F, T

**EC Risk (R No.):** R11, R39/23/24/25

**EC Safety (S No.):** S7, S16, S36/37, S45

**Component:** Pyridine

**EC Classification:** Xn

**EC Risk (R No.):** R20/21/22

**EC Safety (S No.):** S26, S28

**EC Risk/Safety Phrases:** See Section 15, “Regulatory Information”.

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#### 4. FIRST AID MEASURES

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**Inhalation:** If adverse effects occur, remove to uncontaminated area. If not breathing, qualified personnel should give artificial respiration. Seek immediate medical attention.

**Skin Contact:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

**Eye Contact:** Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**Ingestion:** If swallowed, get immediate medical attention.

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#### 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Severe fire hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive.

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

**Fire Fighting:** Move container from fire area if it can be done without risk. Do not scatter spilled material with high-pressure water streams. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

**Flash Point (°C):** 11

**Method:** Closed Cup.

**Autoignition (°C):** 385

**Flammability Limits in Air:**

**Upper Explosive Limits (Volume %):** 36

**Lower Explosive Limits (Volume %):** 6

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#### 6. ACCIDENTAL RELEASE MEASURES

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**Occupational Release:** Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Refer to Section 13, "Disposal Considerations".

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#### 7. HANDLING AND STORAGE

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**Storage:** Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances. Store in a well-ventilated area. Sealed ampoules, as received, should be stored in the dark at temperatures at or below -20 °C. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106.

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

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#### 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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**Exposure Limits:**

**Component:** Methanol

NIOSH (TWA): 200 ppm (260 mg/m<sup>3</sup>)

NIOSH (IDLH): 6000 ppm

NIOSH (STEL): 250 ppm (325 mg/m<sup>3</sup>)

ACGIH (TWA): 200 ppm

ACGIH (STEL): 250 ppm

OSHA (TWA): 200 ppm (260 mg/m<sup>3</sup>)

**Component:** Pyridine

NIOSH (TWA): 5 ppm (15 mg/m<sup>3</sup>)

NIOSH (IDLH): 1000 ppm

ACGIH (TWA): 1 ppm (15 mg/m<sup>3</sup>)

OSHA (TWA): 5 ppm

**Ventilation:** Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Respirator:** If workplace conditions warrant a respirator, a respiratory protection plan that meets OSHA 29 CFR 1910.134 must be followed. Refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for applicable certified respirators.

**Eye Protection:** Wear safety goggles. An eye wash station and quick drench shower should be readily available near of handling and use areas.

**Personal Protection:** Wear appropriate chemical resistant gloves. Wear appropriate chemical resistant clothing.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**Component:** Methanol

**Appearance and Odor:** Colorless liquid with an alcohol odor

**Molar Mass:** 32.04 g/mol

**Chemical Formula:** CH<sub>3</sub>OH

**Water Solubility:** Soluble

**Specific Gravity (water = 1):** 0.7914

**Boiling point:** 65 °C (149 °F)

**Vapor Pressure:** 97.25 mmHg (20 °C)

**Vapor Density (air = 1):** 1.11

**Component:** Pyridine

**Appearance and Odor:** Brown liquid, odor not available

**Molar Mass:** 79.10 g/mol

**Chemical Formula:** C<sub>5</sub>H<sub>5</sub>N

**Water Solubility:** Soluble

**Specific Gravity (water = 1):** 0.93

**Boiling point:** 115 °C (239 °F)

**Vapor Pressure:** 18 mmHg (20 °C)

**Vapor Density (air = 1):** 2.7

**pH:** 8.2 (0.2 M)

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## 10. STABILITY AND REACTIVITY

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**Stability:**  Stable  Unstable

Stable at normal temperature and pressure.

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

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

**Fire/Explosion Information:** Refer to Section 5, "Fire Fighting Measures".

**Hazardous Decomposition:** Thermal decomposition or combustion produces oxides of carbon, various organic fragments.

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

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Entry:**  Inhalation  Skin  Ingestion

### Toxicity Data:

**Component:** Methanol

Human, Inhalation, LC<sub>50</sub>: 300 ppm

Human, Oral, TDLo: 143 g/kg

**Component:** Pyridine

Rat, Inhalation LC<sub>50</sub>: 9010 ppm (1 h)

Mouse, Oral LD<sub>50</sub>: 1500 mg/kg

Guinea pig, Dermal LD<sub>50</sub>: 1 g/kg

**Target organs:****Component:** Methanol

Nervous system. May cause blindness.

**Component:** Pyridine

Central Nervous system

**Mutagen/Teratogen:**

The components of this material have been investigated as possible mutagens and reproductive effectors. The Registry of Toxic Effects of Chemical Substances (RTECS), publishes the following endpoints.

**Component:** Methanol

Human Mutagenic: 300 mmol/L

**Component:** Pyridine

Rat, Tumorigenic Oral TDLo: 24g/kg (2 years)

Mouse, Mutagenic: 700 mg/kg

**Health Effects (Acute Exposure):** See Section 2 "Hazard Identification".**Medical Conditions Generally Aggravated by Exposure:** Allergies and eye, kidney, and skin disorders.

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**12. ECOLOGICAL INFORMATION**

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**Ecotoxicity Data****Component:** MethanolFish Toxicity: Fathead minnow (*Pimephales promelas*), 28 200 mg/L (LC<sub>50</sub>/96 hrs/flow-through)Fish Toxicity: Fathead minnow (*Pimephales promelas*), >100 mg/L (LC<sub>50</sub>/96 hrs/static)**Component:** PyridineFish Toxicity: Fathead minnow (*Pimephales promelas*), 63-74 mg/L (LC<sub>50</sub>/96 hours/ flow-through)Invertebrate Toxicity: Water flea (*Daphnia magna*), 520 mg/L (EC<sub>50</sub>/24 hours)

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**13. DISPOSAL CONSIDERATIONS**

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**Waste Disposal:** Dispose in accordance with all applicable federal, state, and local regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Methanol Hazardous Waste Number(s): U154. Keep out of water supplies and sewers.

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**14. TRANSPORTATION INFORMATION**

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**U.S. DOT and IATA:** Methanol; UN1230; Hazard Class 3, Packing Group II, Sub Risk 6.1.

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**15. REGULATORY INFORMATION**

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**U.S. REGULATIONS**

CERCLA Sections 102a/103 (40 CFR 302.4):

Methanol, 5000 lb final RQ; 2270 kg final RQ. Pyridine, 1000 lb final RQ; 454 kg final RQ

SARA Title III Section 302 (40 CFR 355.30): Not applicable.

SARA Title III Section 304 (40 CFR 355.40): Not applicable.

SARA Title III Section 313 (40 CFR 372.65):

Methanol, 1.0 % de minimis concentration. Pyridine, 1.0 % de minimis concentration

OSHA Process Safety (29 CFR 1910.119): Not applicable.

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 (pyridine) known to the state of California to cause cancer.

**CANADIAN REGULATIONS**

WHMIS Information: Not provided for this material.

## EUROPEAN REGULATIONS

**Component:** Methanol

**EC Classification (assigned)**

T: Toxic

F: Flammable

**EC Risk Phrases**

R11 - Highly Flammable.

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:** Pyridine

**EC Classification (assigned)**

Xn: Harmful.

**EC Risk Phrases**

R20/21/22 - Harmful by inhalation, in contact with skin and if swallowed.

**EC Safety Phrases**

S2 - Keep container tightly closed.

S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S28 - After contact with skin, wash immediately with plenty of water.

## NATIONAL INVENTORY STATUS

**U.S. Inventory (TSCA):** Methanol listed. Pyridine listed.

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

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## 16. OTHER INFORMATION

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**Sources:** ChemADVISOR, Inc., MSDS *Methyl Alcohol*, 10 June 2011.

EC; European Chemical Substance Information System (ESIS), *Methyl Alcohol*, CAS No. 67-56-1; available at <http://esis.jrc.ec.europa.eu/> (accessed Dec 2011).

RTECS; *Methanol*, RTECS No. PC1400000, CAS No. 67-56-1; CDC, May 2009; available at <http://www.cdc.gov/niosh/npg/npgd0397.html> (accessed Dec 2011).

ChemADVISOR, Inc., MSDS *Pyridine*, 10 June 2011.

EC; European Chemical Substance Information System (ESIS), *Pyridine*, CAS No. 110-86-1; available at <http://esis.jrc.ec.europa.eu/> (accessed Dec 2011).

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