

SAFETY DATA SHEET PACKET

Product Identifier

SRM Number: 1934

SRM Name: Fluorescent Dyes for Quantitative Flow Cytometry (Visible Spectral Range)

SRM Description:

This Standard Reference Material (SRM) is intended for use in assigning fluorescence intensity values to calibration standards for quantitative flow cytometry in the visible spectral range. A unit of SRM 1934 consists of four amber ampoules, each containing 2 mL of a different fluorophore solution or suspension. The solutions include Part A: Fluorescein Solution (60 μ M aqueous borate buffer solution); Part B: Nile Red Solution (60 μ M acetonitrile solution); Part C: Coumarin 30 Solution (acetonitrile solution); and Part D: APC Suspension (Allophycocyanin fluorescent protein in aqueous buffer solution, 100 μ L).

SRM 1934 Parts:

Part A: Fluorescein Solution
Part B: Nile Red Solution
Part C: Coumarin 30 Solution
Part D: APC Suspension

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
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: <http://www.nist.gov/srm>

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

This page intentionally left blank.



DATE: 23 March 2016

Product Identifier

SRM Number: 1934
SRM Name: Fluorescent Dyes for Quantitative Flow Cytometry (Visible Spectral Range)
SRM Part: Part A: Fluorescein Solution

Under the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1200, this Standard Reference Material (SRM) is NOT classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified. There are no hazard pictograms, hazard statements or signal word associated with it. Safety Data Sheet information is not required. This document may be used in conjunction with your hazard communication program.

Description: This SRM is intended for use in assigning fluorescence intensity values to calibration standards for quantitative flow cytometry in the visible spectral range. A unit of SRM 1934 consists of four amber ampoules, each containing 2 mL of a different fluorophore solution or suspension. The solutions include Part A: Fluorescein Solution (60 μ M aqueous borate buffer solution); Part B: Nile Red Solution (60 μ M acetonitrile solution); Part C: Coumarin 30 Solution (acetonitrile solution); and Part D: APC Suspension (Allophycocyanin fluorescent protein in aqueous buffer solution, 100 μ L).

The fluorescein solution is approximately 61 μ mol/kg in an aqueous borate buffer (0.10 mol/L) and is not classified as hazardous by OSHA's 29 CFR 1910.1200.

Disposal: SRM 1934 Part A: Fluorescein Solution should be disposed of in accordance with local, state, and federal regulations.

Transport Information: Fluorescein solution is not regulated by the U.S. Department of Transportation (DOT) and/or International Air Transport Association (IATA). However, as sold as part of SRM 1934, it is regulated as UN1648, Acetonitrile solution, Hazard Class 3, Packing Group II, Excepted Qty. E2.

Disclaimer: This document was prepared carefully, using current references. Users of this SRM should ensure that this document and the corresponding Certificate of Analysis in their possession are current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at <http://www.nist.gov/srm>.

This page intentionally left blank.

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 1934
SRM Name: Fluorescent Dyes for Quantitative Flow Cytometry (Visible Spectral Range)
SRM Part: Part B: Nile Red Solution
 Part C: Coumarin 30 Solution
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This SRM is intended for use in assigning fluorescence intensity values to calibration standards for quantitative flow cytometry in the visible spectral range. A unit of SRM 1934 consists of four amber ampoules, each containing 2 mL of a different fluorophore solution or suspension. The solutions include Part A: Fluorescein Solution (60 µM aqueous borate buffer solution); Part B: Nile Red Solution (60 µM acetonitrile solution); Part C: Coumarin 30 Solution (acetonitrile solution); and Part D: APC Suspension (Allophycocyanin fluorescent protein in aqueous buffer solution, 100 µL).

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
 FAX: 301-948-3730
 E-mail: SRMMSDS@nist.gov
 Website: <http://www.nist.gov/srm>

Emergency Telephone ChemTrec:
 1-800-424-9300 (North America)
 +1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Note: The Nile Red solution and Couramin 30 solution are classified as hazardous due to the solvent acetonitrile. The health and safety information is provided in this SDS is for Part B: Nile Red Solution and Part C: Coumarin 30 Solution.

Classification

| | | |
|-------------------------|----------------------------|-------------|
| Physical Hazard: | Flammable Liquid | Category 2 |
| Health Hazard: | Acute Toxicity, Oral | Category 4 |
| | Acute Toxicity, Dermal | Category 4 |
| | Acute Toxicity, Inhalation | Category 4 |
| | Eye Damage/Irritation | Category 2A |

Label Elements

Symbol



Signal Word

DANGER

Hazard Statement(s)

H225 Highly flammable liquid and vapor.
 H302+H312+H332 Harmful if swallowed, in contact with skin, or if inhaled.
 H319 Causes serious eye irritation.

Precautionary Statement(s)

Prevention

| | |
|-----------|--|
| P210 | Keep away from heat, sparks, open flames, hot surfaces. — No smoking. |
| P233 | Keep container tightly closed. |
| P241+P242 | Use explosion-proof electrical and ventilating equipment. Use only non-sparking tools. |
| P243 | Take precautionary measures against static discharge. |
| P261 | Avoid breathing fumes, mist, vapors, or spray. |
| P264 | Wash hands thoroughly after handling. |
| P270 | Do not eat, drink or smoke when using this product. |
| P271 | Use only outdoors or in a well-ventilated room. |
| P280 | Wear protective gloves, eye protection, and protective clothing. |

Response

| | |
|----------------|--|
| P301+P330 | If swallowed: Rinse mouth. |
| P303+P361+P353 | If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water. |
| P304+P340 | If inhaled: Remove person to fresh air and keep comfortable for breathing. |
| P305+P351+P338 | If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P312 | Call a doctor if you feel unwell. |
| P337+P313 | If eye irritation persists: Get medical attention. |
| P362+P363 | Take off contaminated clothing and wash it before reuse. |

Storage

P403+P405+P235 Store in a well-ventilated place. Keep cool.

Dispose

P501 Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: None.

Ingredients(s) with Unknown Acute Toxicity: None.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Acetonitrile solutions

Other Designations: Acetonitrile (cyanomethane; ethanenitrile; ethyl nitrile; methanecarbonitrile; methyl cyanide)

Hazardous components 1 % or greater; carcinogens 0.1 % or greater are listed in compliance with OSHA 29 CFR 1910.1200. There is a trace amount of Nile Red [9-(Diethylamino)-5H-5H-Benzo(a)phenoxazin-5-one; Nile blue A ozazone; phenoxazone 9; C₂₀H₁₈N₂O₂] or Coumarin 30. For the actual concentrations, see the NIST Certificate of Analysis.

| Hazardous Component(s) | CAS Number | EC Number (EINECS) | Nominal Mass Concentration (%) |
|------------------------|------------|--------------------|--------------------------------|
| Acetonitrile | 75-05-8 | 200-835-2 | >99 |

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. Seek medical attention if need; bring the container.

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, immediately call a doctor. If vomiting occurs, keep head lower than the hips to help prevent aspiration.

Most Important Symptoms/Effects, Acute and Delayed: Difficulty breathing, chest pain, vomiting, dizziness, confusion, convulsions, unconsciousness and coma. Note: health effects may be delayed.

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

Acetonitrile

OSHA (PEL): 40 ppm (70 mg/m³) TWA
Prevent or reduce skin absorption (related to cyanide compounds).

ACGIH (TLV): 20 ppm TWA
Skin – potential significant contribution to overall exposure by the cutaneous route.

NIOSH (REL): 20 ppm (34 mg/m³) TWA
500 ppm IDLH

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.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|--|
| Descriptive Properties | Acetonitrile |
| | >99 % |
| Molar Mass (g/mol) | 41.05 |
| Molecular Formula | CH ₃ CN |
| Appearance (physical state, color, etc.) | clear, colorless liquid |
| Odor | sweet odor |
| Odor threshold | 40 ppm |
| pH | not available |
| Evaporation rate (butyl acetate = 1) | 5.79 |
| Melting point/freezing point | -46 °C (-50.8 °F) |
| Relative Density as Specific Gravity (water = 1) | 0.7857 |
| Density | not available |
| Vapor Pressure | 73 mmHg at 20 °C |
| Vapor Density (air = 1) | 1.42 |
| Viscosity | 0.35 cP at 20 °C |
| Solubilities | soluble in water solvent: alcohol, ether, ethyl acetate, methyl acetate, benzene, acetone, chloroform, carbon tetrachloride, ethylene chloride, acetamide solutions, unsaturated hydrocarbons |
| Partition coefficient (n-octanol/water) | not available |
| Thermal Stability Properties | |
| Autoignition Temperature | 524 °C (975.2 °F) |
| Thermal Decomposition | not available |
| Initial boiling point and boiling range | 82 °C (179.6 °F) |
| Explosive Limits, LEL (Volume %) | 3 % |
| Explosive Limits, UEL (Volume %) | 16 % |
| Flash Point (Open Cup) | 6 °C (42.8 °F) |
| Flammability (solid, gas) | not applicable |

10. STABILITY AND REACTIVITY

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: Acids, bases, combustible materials, metals, oxidizing materials, and reducing agents.

Hazardous Decomposition: Oxides of carbon, nitrogen, and cyanides.

Hazardous Polymerization: Will Occur Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: Inhalation Skin Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Nausea, vomiting, respiratory failure, hypotension, convulsions.

Potential Health Effects (Acute, Chronic, and Delayed)

Inhalation: Acute and chronic exposure to high concentrations of acetonitrile may cause irritation of the nose and throat, cough with bloody sputum, nausea, vomiting of blood or bile-like substance, chest or abdominal pain, dizziness, headache, dyspnea or tachypnea, low blood pressure, shock, unconsciousness, coma and death due to nervous system depression. Chronic exposure may also cause anorexia, profuse sweating, hypersalivation, rigidity of the neck, urinary frequency, and albuminuria.

Skin Contact: Acute exposure to acetonitrile may result in irritation, absorption may occur resulting in systemic toxicity.

Eye Contact: Acute exposure to acetonitrile may cause irritation and tearing. Chronic exposure may cause conjunctivitis.

Ingestion: Ingestion of sufficient amounts may cause systemic toxicity as detailed for inhalation.

Numerical Measures of Toxicity

Acute Toxicity: Category 4 for Oral, Dermal, and Inhalation.

Rabbit, Dermal, LD50: >2000 mg/kg

Rat, Oral, LD50: 2460 mg/kg

Rat, Inhalation, LC50: 17 100 ppm (4 h); 7551 ppm (8 h)

Skin Corrosion/Irritation: Not classified.

Rabbit, skin: 500 mg open skin, mild

Serious Eye Damage/Irritation: Category 2A.

Rabbit, eyes: 100 µL (24 h) moderate

Respiratory Sensitization: No data available.

Skin Sensitization: No data available.

Germ Cell Mutagenicity: No data available.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen _____ **Yes** _____ **X** **No**

Acetonitrile is not listed by IARC, NTP, or OSHA as a carcinogen/potential carcinogen.

Tumorigenic: Rat, Inhalation, TCLo: 400 ppm (6 h)

Mutagenic: Hamster: 5 g/L; *Drosophila melanogaster*: 131 ppm; *Saccharomyces cerevisiae*: 47 600 ppm

Reproductive Toxicity: Not classified.

Hamster, Inhalation, TCLo: 8000 ppm (1 h, pregnant 8 d)

Hamster, Oral, TDLo: 300 mg/kg (pregnant 8 d)

Rat, Inhalation, TCLo: 1800 ppm (6 h, pregnant 6 d to 20 d)

Specific Target Organ Toxicity, Single Exposure: Not classified.

Specific Target Organ Toxicity, Repeated Exposure: Not classified.

Aspiration Hazard: Not classified.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: Fish, Bluegill (*Lepomis macrochirus*), LC50: 1850 mg/L (96 h) static

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations. Subject to US EPA 40 CFR 262; hazardous waste number U003.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN1648, Acetonitrile solution, Hazard Class 3, Packing Group II, Excepted Qty. E2.

15. REGULATORY INFORMATION

U.S. Regulations

CERCLA Sections 102a/103 (40 CFR 302.4): Acetonitrile: 5000 lb (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): Acetonitrile: 1.0 % de minimis concentrations.

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: No
FIRE: Yes
REACTIVE: No
PRESSURE: No

State Regulations: California Proposition 65: Not listed.

U.S. TSCA Inventory: Acetonitrile is listed.

TSCA 12(b), Export Notification: Section 4, 1 % de minimus concentration.

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

16. OTHER INFORMATION

Issue Date: 23 March 2016

Sources: ChemADVISOR, Inc., SDS *Acetonitrile*, 09 December 2015.

CDC, NIOSH, *Acetonitrile*, RTECS# AL7700000, CAS No. 75-05-8; available at <http://www.cdc.gov/niosh-rtecs/AL757E20.html> (accessed Mar 2016).

International Programme on Chemical Safety, Environmental Health Criteria 154, *Acetonitrile*, World Health Organization, Geneva, 1993.

European Chemicals Agency, Registered Substances, *Acetonitrile* CAS No. 75-05-8, Harmonised classification, available at: <http://echa.europa.eu/> (accessed Mar 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 | STOT | Specific Target Organ Toxicity |
| LD50 | Median Lethal Dose or Lethal Dose, 50 % | STEL | Short Term Exposure Limit |
| LEL | Lower Explosive Limit | TLV | Threshold Limit Value |
| MSDS | Material Safety Data Sheet | TPQ | Threshold Planning Quantity |
| NFPA | National Fire Protection Association | TSCA | Toxic Substances Control Act |
| NIOSH | National Institute for Occupational Safety and Health | TWA | Time Weighted Average |
| NIST | National Institute of Standards and Technology | UEL | Upper Explosive Limit |
| n.o.s. | Not Otherwise Specified | WHMIS | Workplace Hazardous Materials Information System |

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; or via the Internet at <http://www.nist.gov/srm>.



DATE: 23 March 2016

Product Identifier

SRM Number: 1934
SRM Name: Fluorescent Dyes for Quantitative Flow Cytometry (Visible Spectral Range)
SRM Part: Part D: APC Suspension

Under the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1200, this Standard Reference Material (SRM) is NOT classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified. There are no hazard pictograms, hazard statements or signal word associated with it. Safety Data Sheet information is not required. This document may be used in conjunction with your hazard communication program.

Description: This SRM is intended for use in assigning fluorescence intensity values to calibration standards for quantitative flow cytometry in the visible spectral range. A unit of SRM 1934 consists of four amber ampoules, each containing 2 mL of a different fluorophore solution or suspension. The solutions include Part A: Fluorescein Solution (60 μ M aqueous borate buffer solution); Part B: Nile Red Solution (60 μ M acetonitrile solution); Part C: Coumarin 30 Solution (acetonitrile solution); and Part D: APC Suspension (Allophycocyanin fluorescent protein in aqueous buffer solution, 100 μ L).

The APC Suspension is approximately 4 mg/mL solution in 60 % saturated ammonium sulfate, 50 mM potassium phosphate, pH 7.0 and is not classified as hazardous by OSHA's 29 CFR 1910.1200.

Disposal: SRM 1934 Part D: APC Suspension should be disposed of in accordance with local, state, and federal regulations.

Transport Information: SRM 1934, APC Suspension is not regulated by the U.S. Department of Transportation (DOT) and/or International Air Transport Association (IATA). However, as sold as part of SRM 1934, it is regulated as UN1648, Acetonitrile solution, Hazard Class 3, Packing Group II, Excepted Qty. E2.

Disclaimer: This document was prepared carefully, using current references. Users of this SRM should ensure that this document and the corresponding Certificate of Analysis in their possession are current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at <http://www.nist.gov/srm>.