Date of Issue:
08 June 2015

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 2267
SRM Name: Deuterated Levoglucosan in Ethyl Acetate
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is a solution of deuterated levoglucosan in ethyl acetate. This SRM is intended primarily for use as an internal standard or surrogate internal standard solution that is used to spike both the unknown sample and a calibration or external standard solution of non-labeled levoglucosan. A unit of SRM 2267 consists of five two-milliliter ampoules, each containing approximately 1.2 mL of solution.

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

Classification

Physical Hazard:	Flammable Liquids	Category 2
Health Hazard:	Serious Eye Damage/Eye Irritation	Category 2A
	STOT-Single Exposure	Category 3

Label Elements

Symbol

Signal Word

DANGER

Hazard Statement(s)

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

Precautionary Statement(s)

P210	Keep away from heat, sparks, open flames, 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.
P261	Avoid breathing fumes, mist, vapors, or spray.
P264	Wash hands thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves, protective clothing, and eye protection.
P301+P330+P331	If swallowed: Rinse mouth. Do NOT induce vomiting.

P304+P340	If inhaled: Remove victim to fresh air and keep at rest in a position 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.
P337+P313	If eye irritation persists: Get medical attention.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P312	Call a doctor if you feel unwell.
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Deuterated levoglucosan in ethyl acetate

Other Designations: Acetic acid ethyl ester; acetic ether; acetidin; acetoxyethane; ethyl ethanoate; vinegar naphtha; acetic ester; ethyl acetic ester; ethyl acetate, anhydrous; ethyl acetate ester

The health and safety information provided is for ethyl acetate, the main component of this solution. Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the NIST Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Ethyl acetate	141-78-6	205-500-4	99.9

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Seek immediate medical attention.

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

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

Ingestion: Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

Most Important Symptoms/Effects, Acute and Delayed: Respiratory tract irritation, eye irritation, and central nervous system depression.

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. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive above flash point. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Alcohol-resistant foam, carbon dioxide, regular dry chemical, and water.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Thermal decomposition will form oxides of oxides of carbon.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. 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: Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Avoid heat, flames, sparks and other sources of ignition. Remove sources of ignition. Reduce vapors with water spray. Absorb with sand or other noncombustible material. Collect spilled material in appropriate container for disposal. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection". Handle glass ampoules with care.

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances (see Section 10, "Stability and Reactivity").

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

NIOSH (REL): 400 ppm (1400 mg/m^3) (TWA)
2000 ppm (IDLH, 10 % LEL)

ACGIH (TLV): 400 ppm (TWA)

OSHA (PEL): 400 ppm (1400 mg/m^3) (TWA)

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

Personal Protection: 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/Face Protection: Wear splash resistant safety goggles with a face shield. An eyewash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

NOTE: The physical and chemical data provided are for ethyl acetate the main component. No physical or chemical data are available for this solution. The actual behavior of the solution may differ from the individual component.

Descriptive Properties

Appearance (physical state, color, etc.):	clear to colorless liquid
Molecular Formula:	$C_4H_8O_2$
Molar Mass (g/mol):	88.1
Odor:	varying odor
Odor threshold:	50 ppm
pH:	(neutral)
Evaporation rate:	6.2 (butyl acetate = 1)
Melting point/freezing point (°C):	–84 (–119.2 °F)
Relative Density (g/L) as specific gravity (water = 1):	0.9003
Vapor Pressure (mmHg):	73 at 20 °C
Vapor Density (air = 1):	3.04
Viscosity (cP):	not available
Solubility(ies):	soluble in water (8.7 %), alcohol, benzene, ether, acetone, and chloroform
Partition coefficient (n-octanol/water):	not available

Thermal Stability Properties

Autoignition Temperature (°C):	426 (799 °F)
Thermal Decomposition (°C):	not available
Initial boiling point and boiling range (°C):	77 (171 °F)
Explosive Limits, LEL (Volume %):	2
Explosive Limits, UEL (Volume %):	11.5
Flash Point (Closed Cup):	–4 °C (24.8 °F)
Flammability (solid, gas):	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

Incompatible Materials: Acids, bases, combustible materials, and oxidizing materials.

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

Hazardous Decomposition: Thermal decomposition will produce oxides of carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Respiratory tract irritation, eye irritation, and central nervous system depression.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Inhalation of 400 ppm for 3 min to 5 min has caused respiratory tract irritation. Exposure may result difficulty in breathing, headache, drowsiness, dizziness, loss of coordination, kidney damage, liver damage, and unconsciousness.

Skin Contact: Direct contact may cause irritation with redness and defatting action on the skin.

Eye Contact: Direct contact may cause irritation, with redness, pain, and lacrimation. Exposure to 400 ppm may cause a sensation of irritation. Repeated or prolonged exposure may cause conjunctivitis and cornea clouding.

Ingestion: Ingestion of small amounts may cause sore throat, abdominal pain, and diarrhea. Large amounts may cause central nervous system depression, with dizziness, headache, weakness, fatigue, drowsiness, and unconsciousness. Poisoning may cause congestion of the liver and kidney.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified.
Rat, Oral LD50: 5620 mg/kg
Rabbit, Dermal LD50: >18 000 mg/kg
Mouse, Inhalation LC50: 1500 ppm (4 h)

Skin Corrosion/Irritation: Not classified.

Serious Eye Damage/Irritation: Category 2A; Direct contact may cause irritation with redness, pain and lacrimation.
Human, Eyes: 400 ppm

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: No data available.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen _____ Yes __X__ No
Ethyl acetate is not listed by NTP, IARC or OSHA as a carcinogen/potential carcinogen.

Reproductive Toxicity: Not classified.

Specific Target Organ Toxicity, Single Exposure: Category 3; Low vapor concentrations may cause dizziness and drowsiness. High concentration may cause narcotic effects.

Specific Target Organ Toxicity, Repeated Exposure: Not classified.

Aspiration Hazard: No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Fish Toxicity:	Fathead minnow (*Pimephales promelas*) LC50 (flow-through): 220 mg/L to 250 mg/L (96 h)
	Rainbow trout (*Oncorhynchus mykiss*) LC50 (flow-through): 484 mg/L (96 h)
Invertebrate:	Freshwater water flea (*Daphnia magna*) EC50 (static): 560 mg/L (48 h)

Persistence and Degradability: No data available.

Bioaccumulative Potential: 30 species: fish

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262, Hazardous Waste Numbers: U112 (Ignitable waste).

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN1173; Ethyl Acetate; Hazard Class 3; Packing Group II; Excepted Quantity: E2.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): 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): Not regulated.

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: Listed.

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

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 08 June 2015

Sources: ChemAdvisor, Inc., SDS *Ethyl Acetate*, 20 March 2015.

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 Transportation Agency	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 %	STOT	Specific Target Organ Toxicity
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