NIST National Institute of Standards and Technology U.S. Department of Commerce

SRM SPOTLIGHT

March 2013

Editor: Regina R. Montgomery

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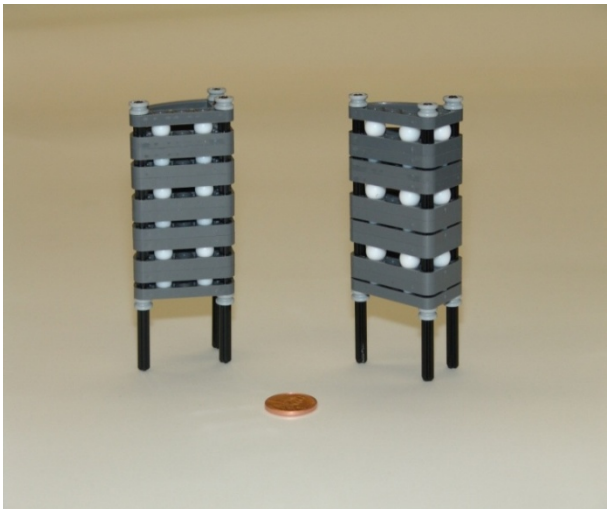
# New and Renewal NIST SRMs/RMs

## SRM 2087 Dimensional Standard for Medical Computed Tomography

This Standard Reference Material is for determining the length scales within medical computed tomography (CT). This reference device consists of solid polytetrafluoride ethylene balls separated by precision plastic spacers. The central positions of the distances between the balls are certified with an uncertainty of 0.15 mm. The distances are traceable to the International System of Units (SI). The entire package may be held in the palm of the hand and contains only common, inert materials.

All of the materials are selected to be within the range of radiodensity (measured in Hounsfield units in medical CT) that is found in the human body. Yet there is high contrast between the parts, so a simple threshold procedure may be used to determine the extent of each ball in a CT reconstruction. Moreover, each ball is held symmetrically, so the fixture will have little influence on the position of the centers of the balls as measured in the CT.

A typical experiment may search for distortions within the CT field. For example, the ratio of the length scales in the transverse to longitudinal directions may be found. Differences in the length scale from the isocenter of the CT to the edge of the field may also be investigated.



*Prototype of SRM 2087*

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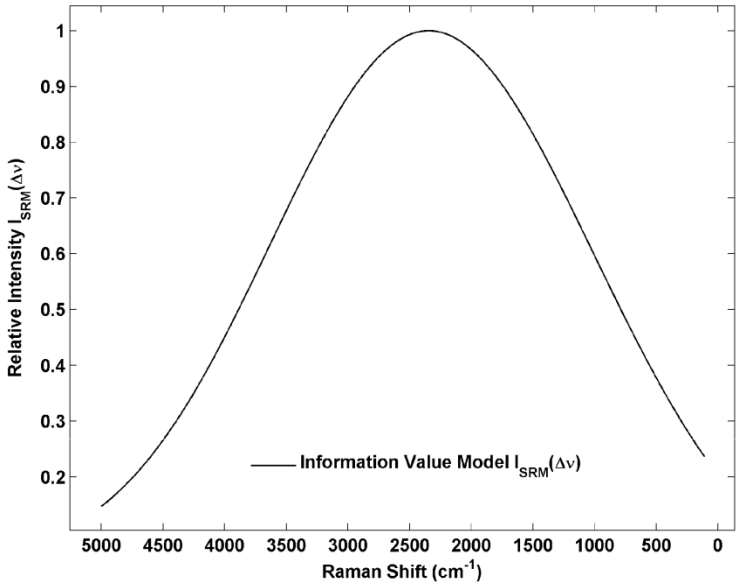
# SRM 2246 Relative Intensity Correction Standard for Raman Spectroscopy Utilizing 830 nm Excitation

SRM 2246 is the sixth in a series of Standard Reference Materials (2241, 2242, 2243, 2244, and 2245) that provide relative intensity correction for Raman spectrometers employing lasers commonly used for Raman spectroscopy. Raman spectroscopy is becoming a popular analytical technique because the Raman spectrum of a compound can be used to uniquely identify a material with little, or, in many cases, no sample preparation. In addition, a Raman spectrum can be acquired through common glass containers, making this an ideal technology for first responders, HazMat teams, members of the Transportation Security Administration, and others wishing to identify materials through transparent containers without exposing themselves or the instrument to the material.

Because Raman scattering is an emission process, the spectra acquired are necessarily convolved with the instrument response. Detector spectral response, grating efficiency, and filter bandpass are among the largest contributors to the unique spectrometer response function. As a result, current Raman libraries are necessarily vendor-, if not instrument-, specific. This makes intercomparison and/or interchange of Raman spectral data from various sources difficult. The only remedy in the past was to correct the spectra for the unique instrument response by measuring a calibrated irradiance source under the same conditions as the sample. These sources are expensive, difficult to correctly align with the instrument, and require periodic recalibration. As a result, they were used infrequently for routine calibration of Raman instruments. This SRM replaces the calibrated irradiance source and is a glass that produces a featureless fluorescence spectrum when illuminated with the Raman excitation laser. SRM 2246 is relatively inexpensive, does not require power or recalibration, and alignment issues are minimized as the SRM is placed in the same position as the sample.




*Linearly shifted log-normal model describing the luminescence spectrum of SRM 2246 when excited at 830 nm evaluated over the full range to which data was fit, 110 $cm^{-1}$ to 5000 $cm^{-1}$ Raman shift. The model fit from 3000 $cm^{-1}$ to 5000 $cm^{-1}$ is provided as an information value model. The horizontal axis has dimensions of Raman shift ($cm^{-1}$). The vertical axis is a relative scale and normalized to unity with the dimensions of number of photons per second per square centimeter per wavenumber.*

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# SRM 3233 Fortified Breakfast Cereal
# SRM 3234 Soy Flour

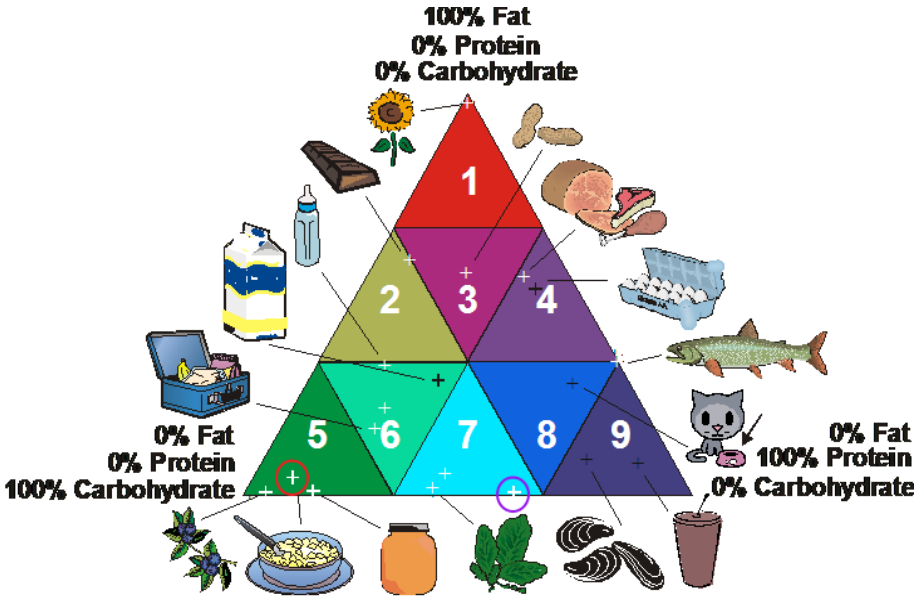
## New Breakfast Cereal and Soy Flour SRMs Issued for Nutrient Analyses

Standard Reference Materials 3233 Fortified Breakfast Cereal and 3234 Soy Flour are the latest in a series of food-matrix SRMs available from NIST. These SRMs support the requirements of the Nutrition Labeling and Education Act of 1990, whereby nutrition information must be provided on labels of processed foods sold in the United States.

SRM 3233 Fortified Breakfast Cereal has certified values assigned for elements and water-soluble vitamins. Reference values are provided for proximates, sugars, fatty acids, amino acids and total dietary fiber. A unit of this material consists of one jar containing 60 g of powdered cereal. The definition of dietary fiber in nutrition has been evolving (natural, synthetic, insoluble, soluble, high molecular weight, low molecular weight), and method-specific values have been assigned in this SRM.

SRM 3234 Soy Flour has certified values assigned for nutrient elements and water-soluble vitamins, and reference values for proximates, fatty acids and amino acids. A unit of this material consists of one jar containing 50 g of soy flour.

As is true for all of NIST's food-matrix SRMs, SRMs 3233 and 3234 are intended for use as primary control materials when assigning values to in-house (secondary) control materials and for validation of analytical methods for the measurement of nutrients in similar matrices.




*Food triangle showing the location of SRM 3233 Fortified Breakfast Cereal (red circle) and SRM 3234 Soy Flour (purple circle).*

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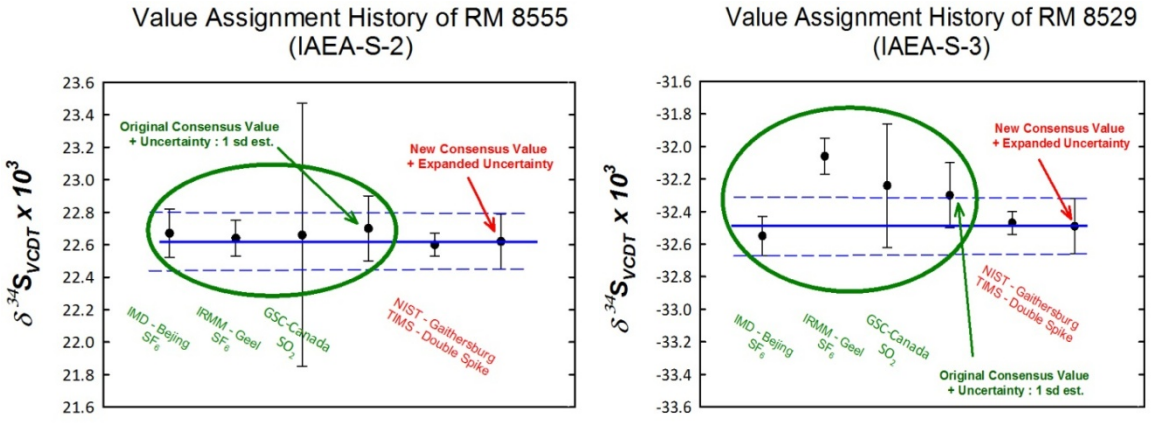
## RM 8555 (IAES-S-2) and RM 8529 (IAEA-S-3), Sulfur Isotopes in Silver Sulfide

These two reference materials are intended as unbiased benchmarks when measuring relative differences in sulfur (S) isotope number ratios, $R(^{34}S/^{32}S)$ in natural samples. They anchor $\delta^{34}S$ normalizations on the $^{34}S$ enriched (RM 8555) and $^{34}S$ depleted (RM 8529) ends of the Vienna Cañon Diablo Troilite (VCDT) scale. The $\delta^{34}S_{VCDT}$ scale is defined by the International Union of Pure and Applied Chemistry (IUPAC) by assigning a consensus $\delta^{34}S$ value of –0.3 ‰ to RM 8554, where the symbol ‰ is parts per thousand and is equal to 0.001. Natural samples with enriched or depleted $R(^{34}S/^{32}S)$ values relative to that of RM 8554 are reported as positive or negative deviations from that RM in parts per thousand on this scale.

The $\delta^{34}S_{VCDT}$ scale is unique among the various $\delta$-scales used for measuring relative differences in isotope number ratios of the light elements of biogeochemical interest (e.g., oxygen (O), nitrogen (N), carbon (C), and hydrogen (H)). While all light element $\delta$-scales have at least one normalization anchor standard (generally on the depleted side of the scale) as well as a "zero" point standard that defines the scale, the sulfur VCDT $\delta$-scale has normalization anchors for both enriched and depleted ends of its scale.

Unfortunately, incorrect consensus values and uncertainties were originally assigned to these two RMs. This produced inconsistencies in measurement results that revealed that one or both of the RMs were incorrectly calibrated. Subsequent work at NIST using double-spike multi-collector thermal ionization mass spectrometry resolved this issue, producing unbiased values and uncertainties. IUPAC has accepted these new values and associated uncertainties and this is reflected in the new Report of Investigation issued for each of these RMs. Unbiased $\delta^{34}S$ values can now be measured on both the enriched and depleted ends of the sulfur $\delta$-scale and will allow the calculation of more accurate and consistent mass-independent $\Delta^{33}S$ and $\Delta^{36}S$ values.

A unit of RM 8555 and RM 8529 each consist of one bottle containing approximately 0.5 g of silver sulfide ($Ag_2S$).




*All uncertainties are 1 standard deviation with the exception of the New Consensus Value, which is an Expanded Uncertainty (Data from Mann et al., 2009, RCM 23: 1116-1124). See Report of Investigation for RMs 8529 and 8555 for details:*

- *https://www-s.nist.gov/srmors/view_report.cfm?srm=8529*
- *https://www-s.nist.gov/srmors/view_report.cfm?srm=8555*

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# Renewals

**SRM 1683b** Nitric Oxide in Nitrogen (Nominal Amount-of-Substance Fraction 50 µmol/mol), Lot 45-V-XX

**SRM 1684b** Nitric Oxide in Nitrogen (Nominal Amount-of-Substance Fraction 100 µmol/mol), Lot 44-T-XX

**SRM 1687b** Nitric Oxide in Nitrogen (Nominal Amount-of-Substance Fraction 1000 µmol/mol), Lot 41-L-XX

**SRM 1887b** Portland Cement

**SRM 1974c** Organics in Mussel Tissue (*Mytilus edulis*)

**SRM 2092** Low-Energy Charpy V-Notch Impact Specimen

**SRM 2096** High-Energy Charpy V-Notch Impact Specimen

**SRM 2383a** Baby Food Composite

**SRM 2639a** Carbon Monoxide in Nitrogen (Nominal Amount-of-Substance Fraction 1 % mol/mol), Lot 54-F-XX

**SRM 4320b** Curium-244 Radioactivity Standard

**SRM 4339b** Radium-228 Radioactivity Standard

# Revisions

## *Certificate Revisions: Are You Using These Materials?*

This is a list of our most recent certificate revisions. NIST updates certificates for a variety of reasons, such as to extend the expiration date or to include additional information gained from stability testing. Users of NIST Standard Reference Materials should ensure that they have the current certificates. You can print or view a copy of the current certificate at our website at **http**://**www.nist.gov/srm**, or contact the Office of Reference Materials at **phone** 301-975-2200, **fax** 301-926-4751, or **email** srminfo@nist.gov.

**SRM 160b Stainless Steel (Cr 18-Ni 12-Mo 2) (AISI 316)**
Technical changes
Editorial changes

**SRM 360b Zirconium (Sn-Fe-Cr) Alloy**
Technical changes
Editorial changes

**SRM 1082 Cigarette Ignition Strength Standard**
Editorial changes

**SRM 1134 Low-Alloy High-Silicon Steel**
Editorial changes

**SRM 1155 Stainless Steel (Cr 18-Ni 12-Mo 2 (AISI 316)**
Technical changes
Editorial changes

# Revisions (continued)

**SRM 1196 Standard Cigarette for Ignition Resistance Testing**
Technical changes
Editorial changes

**SRM 1202 Fabric Smoldering Ignition Testing Materials**
Editorial changes

**SRM 1243 Ni-Cr-Co Alloy UNS N07001 (disk form)**
Technical changes
Editorial changes

**SRM 1358a Coating Thickness Standard (Nonmagnetic Coating on Steel)**
Technical changes
Editorial changes

**SRM 1358b Coating Thickness Standard (Nonmagnetic Coating on Steel)**
Technical changes
Editorial changes

**SRM 1359b Coating Thickness Standard (Nonmagnetic Coating on Steel)**
Technical changes
Editorial changes

**SRM 1361b Coating Thickness Standard (Nonmagnetic Coating on Steel)**
Technical changes
Editorial changes

**SRM 1363b Coating Thickness Standard (Nonmagnetic Coating on Steel)**
Technical changes
Editorial changes

**SRM 1364b Coating Thickness Standard (Nonmagnetic Coating on Steel)**
Technical changes
Editorial changes

**SRM 1549 Non-Fat Milk Powder**
Editorial changes

**SRM 1597a Complex Mixture of Polycyclic Aromatic Hydrocarbons from Coal Tar**
Technical changes
Editorial changes

**SRM 1661a Sulfur Dioxide in Nitrogen (Nominal Amount-of-Substance Fraction 500 µmol/mol), Lot 94-H-XX**
Editorial changes

**SRM 1663a Sulfur Dioxide in Nitrogen (Nominal Amount-of-Substance Fraction 1500 µmol/mol), Lot 92-G-XX**
Technical changes
Editorial changes

# Revisions (continued)

**SRM 1679c Carbon Monoxide in Nitrogen (Nominal Amount-of-Substance Fraction 100 µmol/mol), Lot 3-I-XX**
New expiration date: 28 January 2020

**SRM 1693a Sulfur Dioxide in Nitrogen (Nominal Amount-of-Substance Fraction 50 µmol/mol), Lot 96-K-XX**
New expiration date: 22 March 2019

**SRM 1830 Soda Lime Float Glass**
Editorial changes

**SRM 1893 Copper Microhardness Test Block (Knoop), Lot No. 09**
Editorial changes

**SRM 1894a Vickers Microhardness of Copper**
Editorial changes

**SRM 1895 Nickel Microhardness Test Block (Knoop), Lot No. 09**
Editorial changes

**SRM 1896b Vickers Microhardness of Nickel**
Editorial changes

**SRM 1908 Vickers Microhardness of Nickel**
Editorial changes

**SRM 1909 Vickers Microhardness of Nickel**
Editorial changes

**SRM 1946 Lake Superior Fish Tissue**
Technical changes
Editorial changes

**SRM 1947 Lake Michigan Fish Tissue**
Technical changes
Editorial changes

**SRM 1950 Metabolites in Frozen Human Plasma**
Technical changes
Editorial changes

**SRM 1980 Positive Electrophoretic ($+\mu_E$) Mobility Standard**
Editorial changes
New expiration date: 01 September 2016

**SRM 2036 Near-Infrared Wavelength/Wavenumber Reflection Standard**
Technical changes
New expiration date: 30 November 2022

# Revisions (continued)

**SRM 2372 Human DNA Quantitation Standard**
Technical changes
Editorial changes
New expiration date: 31 December 2017

**SRM 2379 Drugs of Abuse in Human Hair I**
Technical changes
Editorial changes
New expiration date: 01 January 2017

**SRM 2380 Drugs of Abuse in Human Hair II**
Technical changes
Editorial changes
New expiration date: 01 January 2017

**SRM 2392-I Mitochondrial DNA Sequencing (Human HL-60 DNA)**
Editorial changes
New expiration date: 31 March 2018

**SRM 2393 CAG Repeat Length Mutation in Huntington's Disease**
Technical changes
Editorial changes

**SRM 2686a Portland Cement Clinker**
Technical changes
Editorial changes

**SRM 2772 B100 Biodiesel (Soy-Based)**
Technical changes

**SRM 2780 Hard Rock Mine Waste**
Editorial changes
New expiration date: 31 December 2014

**SRM 2798a Vickers Microhardness of Nickel**
Editorial changes

**SRM 2828 Knoop Microhardness of Steel**
Editorial changes

**SRM 2829 Vickers Microhardness of Steel**
Editorial changes

**SRM 3064 Endothall in Water**
Editorial changes
New expiration date: 31 March 2020

# Revisions (continued)

**SRM 3120a Germanium (Ge) Standard Solution, Lot No. 080429**
Editorial changes
New expiration date: 20 October 2015

**SRM 3136 Nickel (Ni) Standard Solution, Lot No. 000612**
Editorial changes
New expiration date: 31 May 2015

**SRM 3140 Platinum (Pt) Standard Solution, Lot No. 000615**
Editorial changes
New expiration date: 27 July 2018

**SRM 3143 Rhenium (Re) Standard Solution, Lot No. 010816**
Editorial changes
New expiration date: 01 September 2018

**SRM 3150 Silicon (Si) Standard Solution, Lot No. 071204**
Editorial changes
New expiration date: 15 August 2014

**SRM 3160a Thulium (Tm) Standard Solution, Lot No. 790912**
Editorial changes
New expiration date: 15 September 2018

**SRM 3163 Tungsten (W) Standard Solution, Lot No. 080331**
Editorial changes
New expiration date: 10 June 2014

**SRM 3169 Zirconium (Zr) Standard Solution, Lot No. 071226**
Editorial changes
New expiration date: 19 December 2013

**SRM 3181 Sulfate Anion Standard Solution, Lot No. 080603**
Editorial changes
New expiration date: 30 November 2016

**SRM 3191 Aqueous Electrolytic Conductivity, Lot No. 101203**
Editorial changes
New expiration date: 29 November 2013

**SRM 3274 Botanical Oils Containing Omega-3 and Omega-6 Fatty Acids**
Technical changes
Editorial changes

**SRM 3275 Omega-3 and Omega-6 Fatty Acids in Fish Oil**
Technical changes
Editorial changes

# ORDER NIST SRMs ONLINE

You can now order NIST SRMs through our online ordering system, which is continually updated. This system is efficient, user-friendly, and secure. Our improved search function finds keywords on SRM detail pages as well as words in titles. **PLEASE NOTE:** Purchase orders and credit cards may be used when ordering an SRM online. Also note that we are placing many historical archive certificates online for your convenience.

https://srmors.nist.gov

## Please Register Your SRM Online!

**Registering will ensure that you will be notified of any technical updates or developments.**

http://tsapps.nist.gov/msdsurvey/register/default.aspx?ID=2

# NIST SRM 2013 Exhibit Schedule

**The Minerals, Metals and Material Society**
*March 3-7, 2013*
Henry B. Gonzalez Convention Center
San Antonio, TX

**Pittsburgh Conference**
*March 17-21, 2013*
Pennsylvania Convention Center
Philadelphia, PA

**Measurement Science Conference/ITS**
*March 18-22, 2013*
Disney Convention Center
Anaheim, CA

**Materials Research Society Spring Meeting**
*April 1-5, 2013*
Moscone West
San Francisco, CA

**American Chemical Society Spring Meeting**
*April 7-11, 2013*
Ernest N. Morial Convention Center
New Orleans, LA

**IFT-Food Expo**
*July 14-16, 2013*
McCormick Place
Chicago, IL

**NCSL Symposium**
*July 14-18, 2013*
Gaylord Opryland Resort
Nashville, TN

**AACC Clinical Lab Expo**
*July 28-August 1, 2013*
George R. Brown Convention Center
Houston, TX

**AOAC Association of Official Chemists 127th Annual Meeting**
*August 25-28, 2013*
Palmer House Hilton
Chicago, IL

**AOAC International**
*September 8-12, 2013*
Indianapolis Convention Center
Indianapolis, IN

**Air Quality IXS**
*October 21-23, 2013*
Crystal Gateway Marriott
Arlington, VA

**Material Science & Tech Conference 13 and Exhibition, combined with ACerS 115th Annual Meeting**
*October 27-31, 2013*
The Palais des congress de Montreal
Quebec, Canada

**Material Research Society Fall Meeting**
*December 1-6, 2013*
Hynes Convention Center
Boston, MA

## PITTCON 2013 Speakers - March 17–21, 2013, Philadelphia, PA

| Date | NIST Staff | Event Title | Time | Location |
|---|---|---|---|---|
| 17-Mar-2013 | Stephen Long | Energy and Energy-Related Environmental SRMs | 1:05pm | Room 126B |
| 17-Mar-2013 | Michele Schantz | SRMs to Support Oil Spill Assessment and Remediation | 1:35pm | Room 126B |
| 17-Mar-2013 | Melissa Phillips | Eggs, Milk, Cereal, and Meat: SRMs for Breakfast | 2:05pm | Room 126B |
| 17-Mar-2013 | Karen Phinney | SRMs for Human Nutritional Assessment | 2:50pm | Room 126B |
| 17-Mar-2013 | Paul A Rudnick | SRM/D: On-Line Access to Qualitative and Quantitative SRM-Derived Data | 3:20pm | Room 126B |
| 18-Mar-2013 | Jeanita Pritchett | Production of Seized Drug Analysis Standards through Inkjet Printing Technology | 8:40am | Room 116 |
| 18-Mar-2013 | Gary W. Kramer | The Current Status of the AnIML 1.0 ASTM Standards | 10:50am | Room 202A |
| 18-Mar-2013 | Stephen Gozo, Jay H. Hendricks, Fan Jingyun, Douglas A. Olson, Gregory F. Strouse, Ahmed Zeeshan | Developing an Integrated Optical Sensing Package for Temperature, Pressure and Humidity Measurements | 9:55am | Room 120B |
| 18-Mar-2013 | Jerry Rhoderick | Preparation and Validation of Green House Gas Primary Standards | 2:40pm | Room 121B |
| 18-Mar-2013 | Michael Kelley | Certification of a Southern Hemisphere and a Northern Hemisphere Air Standard Reference Materials | 3:55pm | Room 121B |
| 19-Mar-2013 | Bruce A Benner | Comparison of Conventional and Microwave-Assisted Acid/Base Hydrolysis of Serum Standard Reference Materials for the Measurement of Fatty Acids | 9:55am | Room 120A |
| 20-Mar-2013 | Anand Mudambi | Standard Instrument Outputs and Environmental Data Standardization at EPA and NIST | 8:30am-10:30am | Room 304 Marriott Hotel |
| 20-Mar-2013 | Chandra Arya, Thomas P. Forbes, Samuel Forry , Jason G. Kralj, Matt S. Munson | Capture of Rare Cells from Whole Blood | 8:40am | Room 116 |
| 21-Mar-2013 | Charles Camp, Marcus Cicerone, Christopher Hartshorn, Young Lee, | Multicomponent Chemical Imaging of Pharmaceutical Solid Dosage Forms with Broadband CARS Microscopy | 4:35pm | Room 117 |

**IMPORTANT MESSAGE about accessing the SRM website at http://www.nist.gov/srm**

**PLEASE NOTE: New security settings to protect your private information have been mandated by the U.S. government. The following are instructions to upgrade your browser settings so you can view SRM documents, perform searches and order online.**

**For Mozilla Firefox**

1) You must have version 3.0.5 or later
2) Enable SSL 3.0
3) Enable TLS 1.0

To enable SSL 3.0 and TLS 1.0

1) Go to Tools > Options
2) Click on the Advanced icon
3) Click the Encryption tab
4) Under Protocols, make sure both boxes are checked

**For Internet Explorer**

1) You must have version 6.0 or later
2) Enable SSL 3.0
3) Enable TLS 1.0

To enable SSL 3.0 and TLS 1.0

1) Go to Tools > Internet Options
2) Click on the Advanced tab
3) Scroll down to Security
4) Make sure that both SSL 3.0 and TLS 1.0 are checked

# INTRODUCING OUR NEW SRM MOBILE

## Access our website on your mobile devices!
## https://www-s.nist.gov/m-srmors

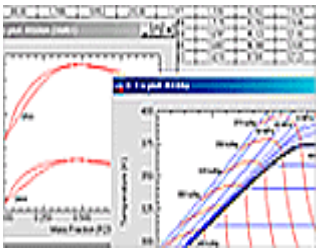
# NIST Measurement Services Websites of Interest

## Standard Reference Materials

Standard Reference Materials
**www.nist.gov/srm**

Historical Archived Certificates/Reports of Investigation
**https://www-s.nist.gov/srmors/certArchive.cfm**

## Standard Reference Data



NIST Scientific and Technical Databases
**http://www.nist.gov/srd**

NIST Data Gateway
**http://srdata.nist.gov/gateway**

## Calibrations

Calibrations Services
**http://www.nist.gov/calibrations**

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