SRM SPOTLIGHT

March 2012

Editor: Regina R. Montgomery

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New and Renewal SRMs/RMs

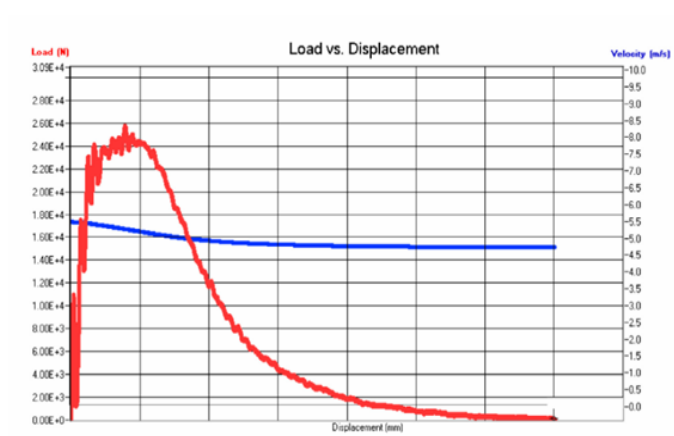
New and Renewal NIST SRMs/RMs

Dynamic Impact Force Verification Specimens: NIST SRMs 2112 (Nominal 24 kN) and 2113 (Nominal 33 kN)

Standard Reference Materials 2112 and 2113 are NIST Charpy V-notch impact specimens that provide a means to simultaneously verify the performance of the energy and force scales of an instrumented Charpy impact machine. Instrumented impact tests provide additional information about impact and fracture toughness properties of materials and represent a scientific enhancement with respect to the traditional Charpy test, now more than 100 years old. In other words, the use of an instrumented machine adds value to Charpy testing. For example, dynamic toughness tests on precracked Charpy specimens tested by means of an instrumented pendulum are now officially standardized in Annex A17 of the ASTM E1820 11 standard of fracture toughness testing. Another useful feature of instrumented tests is the possibility of deriving alternative index temperatures based on force rather than energy parameters, which can better represent the variation of fracture properties with environmental parameters such as irradiation, strain aging, or elevated temperatures.

One of the key factors for deriving meaningful and useful data from instrumented Charpy tests is to ensure that the instrumented Charpy striker is accurately calibrated so that the recorded signal from the strain gages is reliably converted into force applied to the test specimen. The NIST force verification specimens allow users to dynamically verify the performance of their test machines and the calibration of their instrumented strikers by comparing absorbed energies and maximum forces with certified values. No other specimens are currently available in the world for achieving the same results.

SRMs 2112 and 2113 are certified for maximum force and absorbed energy at room temperature, so both scales can be verified at 21 °C. The SRMs can also be used to verify just the absorbed energy scale of a machine at –40 °C, interchangeably with SRMs 2092 and 2096.



The verification of the maximum force is measured dynamically using a Charpy impact machine in accordance with the current ASTM Standard E 2298 or International Organization for Standardization standard ISO 14556. SRM 2112 consists of a set of four specimens needed to perform a maximum force verification at 24.06 kN ± 0.07 kN and an energy scale verification at 105.3 J ± 0.6 J. SRM 2113 consists of a set of four specimens needed to perform one verification at a maximum force of 33 kN ± 1.86 kN and an energy of 18 J ± 0.1 J. For low- and high-energy specimens, the uncertainty in maximum force is equivalent or better than the uncertainty in absorbed energy.

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NIST SRM 2245: Relative Intensity Correction Standard for Raman Spectrometers Utilizing 633 nm Excitation

This Standard Reference Material is the fifth in a series of SRMs (2241, 2242, 2243, and 2244) that provide relative intensity correction for Raman spectrometers employing lasers commonly used for Raman spectroscopy.

Raman spectroscopy is becoming a very popular analytical technique because the Raman spectrum of a compound can be used to identify a material with very 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, Transportation Security Administration (TSA) examiners, and others wishing to identify materials through translucent containers without exposing themselves or the instrument to the material. However, 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- and even instrument-specific. This makes intercomparison and interchange of Raman spectral data from various sources difficult.

In the past, the only remedy 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 infrequently used for routine calibration of Raman instruments. SRM 2245 replaces the calibrated irradiance source with a glass that produces a featureless fluorescence spectrum when illuminated with the Raman excitation laser. NIST provides a mathematical expression describing the “true” fluorescence spectrum of the SRM glass, which was determined using a variety of NIST-calibrated spectrometers and calibrated irradiance sources. The irradiance calibration is effectively transferred by the SRM artifact to the user’s Raman spectrometer by simply measuring the spectrum of the glass and dividing this spectrum by the “true” spectrum. The result then represents a correction curve that is unique to the user’s spectrometer. Multiplying a Raman spectrum of a sample by this correction curve results in a spectrum that is largely corrected for the instrument-dependent response, enabling comparison between systems or searching in standardized libraries. The SRM requires no power, is relatively inexpensive, and does not require recalibration; alignment issues are minimized as the SRM is placed in the same position as the sample.

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NIST SRM 2483 Single-Wall Carbon Nanotubes (Raw Soot)

The National Institute of Standards and Technology has issued the world's first reference material for single-wall carbon nanotube soot, SRM 2483. The new material offers companies and researchers a much-needed source of uniform and well-characterized carbon nanotube soot for material comparisons, as well as chemical and toxicity analysis.

Nanotubes are difficult to produce without significant impurities or in large quantities. Single-wall nanotubes, in particular, have been historically notorious for their variable quality and high batch-to-batch variability. Typically produced in complex processes using small particles of metal catalysts that promote the growth of the nanotubes, the resulting material has frequently contained large amounts of impurities, such as other forms of carbon, and sometimes significant levels of catalysts.

To address these issues, a multidisciplinary research team at NIST developed the metrology necessary for quantitative single-wall carbon nanotube measurements using a three-pronged approach: employing basic measurement and separation science, developing documentary protocols and standards through international standards organizations, and now certifying reference materials.

SRM 2483 Single-Wall Carbon Nanotubes (Raw Soot) directly addresses the issue of comparability. It is possibly the world's single largest supply of homogeneous, chemically analyzed, carbon nanotube soot where the uniformity of the samples from unit to unit is assured. Each unit of SRM 2483, a glass vial containing 250 milligrams of soot, is certified by NIST for the mass fraction values of several common contaminants: barium, cerium, chlorine, cobalt, dysprosium, europium, gadolinium, lanthanum, molybdenum, and samarium. Reference values (values believed to be accurate, but not rising to the level of confidence that NIST certifies) are provided for an additional seven elements.

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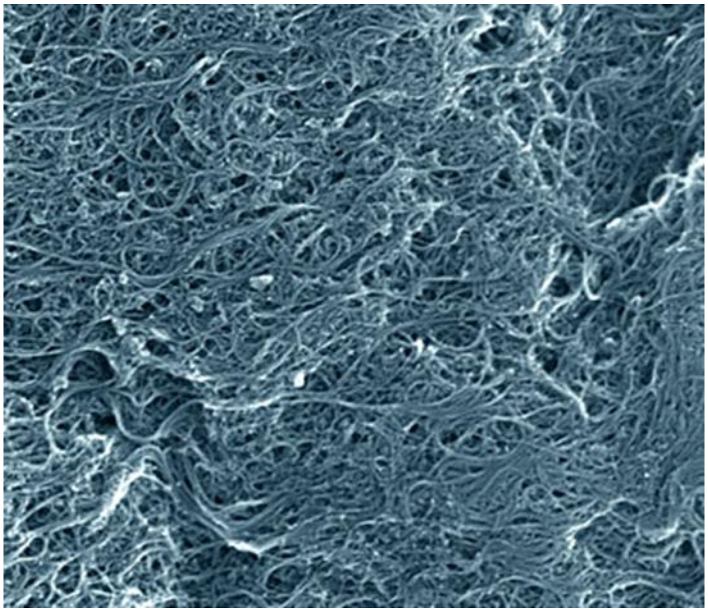

Scanning electron microscope image of a typical sample of the NIST single-wall carbon nanotube soot Standard Reference Material. The nanotubes tend to stick together and form smaller and larger bundles. Some of the impurities also are visible. The image shows an area just over a micrometer wide. (Color added for clarity.) Credit: Vladar, NIST

NIST SRM 2668 Toxic Elements in Frozen Human Urine
NIST SRM 3668 Mercury, Perchlorate, and Iodide in Frozen Human Urine

Two new certified reference materials developed in collaboration with the Centers for Disease Control and Prevention (CDC) are available from NIST for measurements of toxic elements and anions in urine. These Standard Reference Materials will be used by the CDC's biennial National Health and Nutrition Examination Survey as quality control for urine tests, which monitor the U.S. population for exposure to environmental toxins.

Because sample collection is non-invasive and the test results reflect recent exposure (within two days), urine is the preferred matrix for clinical diagnostics and biomonitoring of human exposures to certain toxic environmental chemicals. Typically, urine samples are frozen after collection while awaiting analysis. In the past, NIST produced freeze-dried SRMs for quality assurance of urine measurements, but no matter how closely freeze-dried materials resemble frozen clinical test materials, the differences between them are significant when used for quality assurance.

"Commutability" is a tenet of clinical chemistry stating that a reference material should so closely resemble a specimen that the same types of tests run on both materials generate comparable results. To improve the commutability of reference materials for urine measurements, NIST developed the two frozen urine SRMs. Each new SRM contains two levels of elements and anions, one that corresponds to that of the 50th to 95th percentile of the U.S. population and one that corresponds to > 95th percentile of the U.S. population.

The new frozen urine SRMs improve the quality assurance for the regulated toxic elements found in the freeze-dried counterparts SRMs 2670a, 2671a, and 2672a, and are ready for measurements of emerging environmental contaminants such as perchlorate. Perchlorate can modify thyroid function by competitively inhibiting iodide uptake. The Environmental Protection Agency plans to regulate perchlorate in the environment under the Safe Drinking Water Act. SRM 3668 is the first reference material to be certified for perchlorate in support of regulatory guidelines to come. SRM 2668 provides certified or reference values for 23 elements. The certification measurements of the two SRMs were made at NIST, CDC, Mayo Clinic, and the New York State Department of Health, where clinical techniques were used to ensure relevance of SRMs for the intended applications. The development of SRMs 2668 and 3668 reflects NIST's commitment to continually improve chemical metrology to improve the health of the nation.

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NIST SRM 2779 Gulf of Mexico Crude Oil

The National Institute of Standards and Technology has released a new Standard Reference Material to support the federal government's Natural Resources Damage Assessment (NRDA) in the wake of the April 2010 Deepwater Horizon oil spill 40 miles off the Louisiana coast.

The Deepwater Horizon disaster resulted in the discharge of tens of thousands of barrels of oil per day from the seafloor into the Gulf of Mexico. In what has become the worst offshore oil spill in U.S. history, a wide expanse and variety of natural resources have been exposed to and potentially impacted by oil. During the NRDA, tens of thousands of environmental samples including oil in various forms, water, sediment, and biota are being collected and analyzed to characterize both pre-spill and post-spill environmental conditions.

The petroleum crude oil for SRM 2779 was collected on May 21, 2010 on the drillship Discoverer Enterprise from the insertion tube that was receiving oil directly from the Macondo well during response operations. The oil was collected into cleaned 2.5 liter glass bottles and transported via a defined chain of custody to a laboratory in College Station, Texas. A portion was subsequently provided to NIST under the authority of the National Oceanic and Atmospheric Administration (NOAA) for use in the preparation of SRM 2779.

Using the data from three independent methods of analysis performed at NIST as well as one set of data from an interlaboratory study coordinated by NIST and NOAA, certified and reference values (as mass fractions) are provided for a number of polycyclic aromatic hydrocarbons (PAHs) along with reference values (as mass fractions) for a number of alkylated PAH groups, hopanes and steranes. Each unit of SRM 2779 consists of five ampoules of SRM 2779 each containing 1.2 mL of crude oil. This material will be useful as a quality control material for the on-going analyses to support the NRDA effort.

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NIST SRMs 2816 – 2821: Rockwell N Scale Hardness

The NIST Hardness Standardization Program has expanded the range of available Rockwell hardness Standard Reference Materials to the Rockwell N scales (15N and 30N). The Rockwell N scale hardness test is one of the most commonly used industrial methods for quality assurance and acceptance testing of sheet and thin metal products. The SRMs will be used by hardness testing and calibration laboratories to calibrate and verify their Rockwell hardness machines, providing the lowest level of uncertainty with direct traceability to NIST.

Three SRMs are available at the low, mid and high hardness levels for each of the 15N and 30N scales for a total of six new SRMs. The SRMs are sold individually (not as a set). These are:

SRM 2816 Rockwell Hardness 15N Scale - Low Range (Nominal 72 HR15N)
SRM 2817 Rockwell Hardness 15N Scale - Mid Range (Nominal 83 HR15N)
SRM 2818 Rockwell Hardness 15N Scale - High Range (Nominal 91 HR15N)
SRM 2819 Rockwell Hardness 30N Scale - Low Range (Nominal 45 HR30N)
SRM 2820 Rockwell Hardness 30N Scale - Mid Range (Nominal 64 HR30N)
SRM 2821 Rockwell Hardness 30N Scale - High Range (Nominal 79 HR30N)

These new Rockwell N scale SRMs complement the three currently available low-, mid-, and high-range SRMs available for the Rockwell C scale (SRMs 2810, 2811, and 2812), as well as Vickers and Knoop microindentation hardness SRMs for a range of applied force levels.

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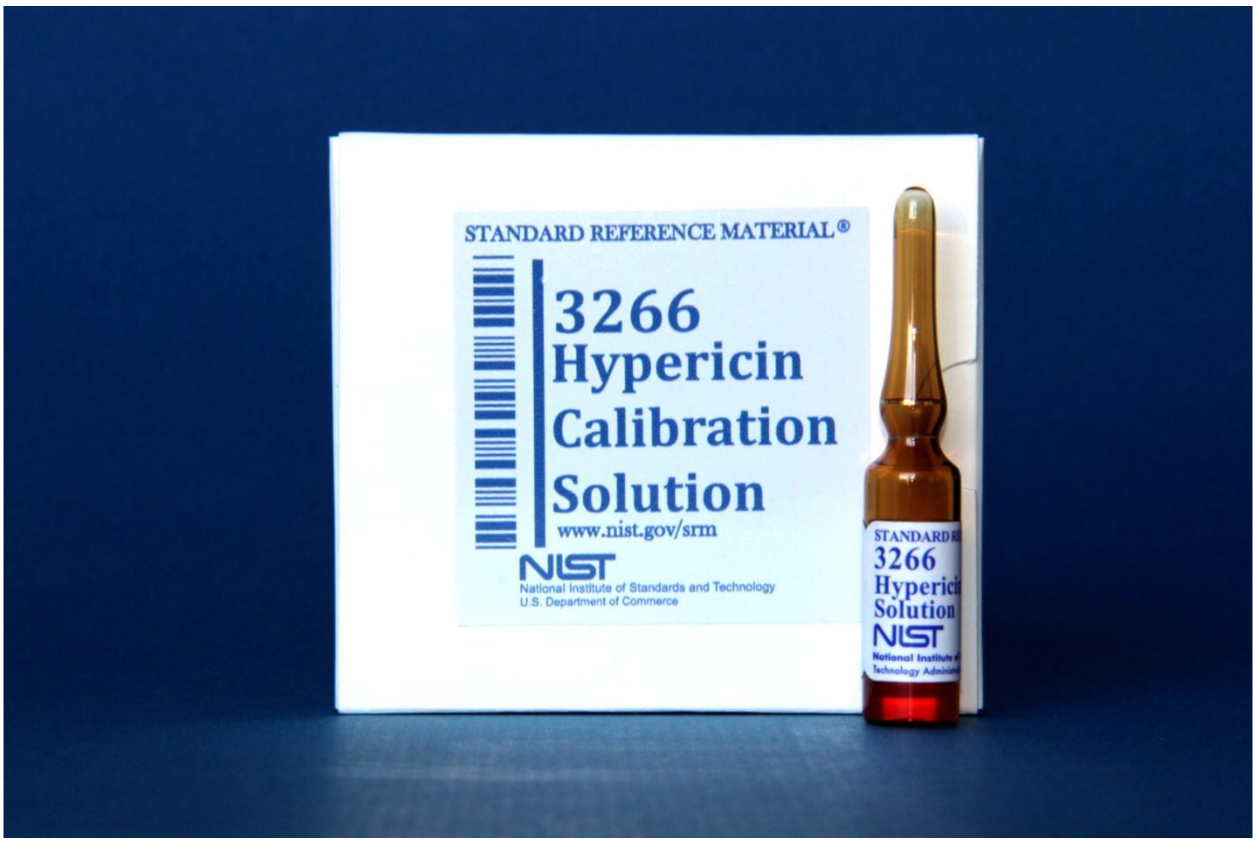
NIST SRM 3266 Hypericin Calibration Solution

The National Institute of Standards and Technology continues to produce Standard Reference Materials to support the measurement of compounds with perceived health benefits in food and dietary supplement products. One such compound is hypericin. Hypericin is naturally occurring in St. John's wort. Manufacturers of products containing St. John's Wort may choose to analyze their products so that they can provide label information about the quantities of these compounds that they contain. SRM 3266, which consists of five ampoules each containing 1.2 mL of solution, can be used for calibration of manufacturers' instrumentation. Eventually, this SRM will be used as a companion to a series of SRMs based on St. John's Wort itself. These matrix materials, which are currently in production, can be used to confirm that the analytical method is working properly when "real" samples are analyzed.



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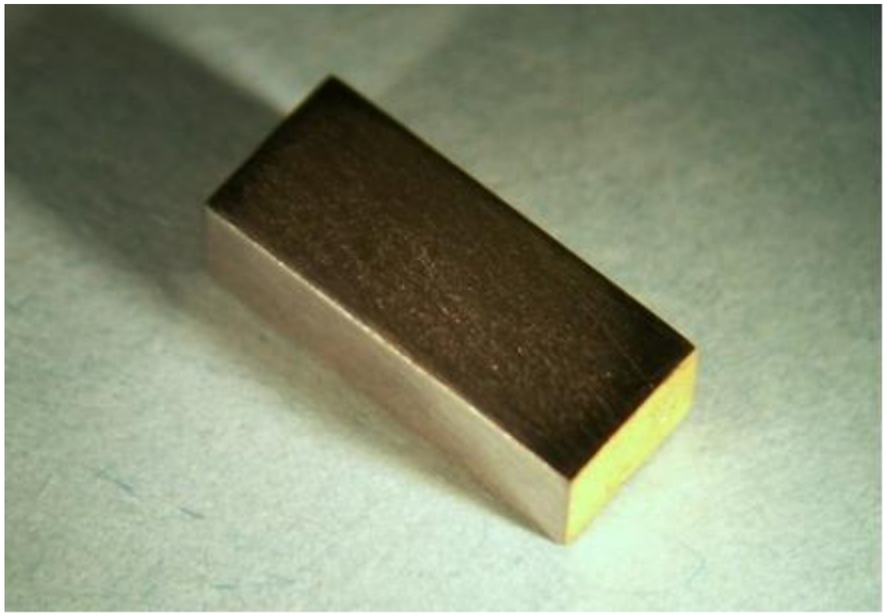
NIST SRM 3451 Low-Temperature Seebeck Coefficient Standard



Researchers at NIST have developed a low-temperature Seebeck coefficient Standard Reference Material (SRM 3451), enabling members of the thermoelectric materials community, for the first time, to reliably calibrate Seebeck coefficient measurement equipment in the temperature range 10 K to 390 K. In recent years, there has been tremendous interest in developing higher efficiency thermoelectric materials for a variety of applications such as automotive engine waste heat recovery, deep space and remote power generation, sensor and integrated circuit spot cooling, and solid-state refrigeration.

Thermoelectric materials enable the solid-state interconversion of thermal and electrical energy. The conversion process is governed by two primary phenomena, the Seebeck and the Peltier effects. These effects are the physical mechanisms for power generation and solid-state refrigeration in thermoelectric devices, respectively. The Seebeck effect is demonstrated by the proportional electric potential that develops across a conductor when placed in an applied temperature difference. The value of this ratio is termed the Seebeck coefficient, $S = \Delta V/\Delta T$.

The continued development of higher-efficiency thermoelectric materials requires thorough characterization of the electrical and thermal transport properties. Due to its intrinsic sensitivity to the electronic structure, the Seebeck coefficient is one essential physical parameter used to identify a material's potential thermoelectric performance. Presently, the diversity of measurement techniques and custom instrumentation employed by researchers often results in conflicting materials data, complicating interlaboratory confirmation and delaying the development of promising candidate materials. The availability of this Seebeck coefficient SRM will validate measurement results, leading to a better understanding of the structure/property relationships and the underlying physics of potential high-efficiency thermoelectric materials.

SRM 3451 is a bar-shaped artifact (approximately 3.5 mm × 2.5 mm × 8.0 mm) of non-stoichiometric bismuth telluride (n-type, Te rich, Bi/Te ratio approximately 2/3, formula Bi_2Te_{3+x}). Certification measurements were performed using a differential steady-state technique with a two-probe arrangement. A Seebeck coefficient interpolation function is provided for intermediate temperatures values, i.e., those in between the 32 certified base temperature measurements.

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PITTCON 2012 Speakers - March 11-15, 2012, Orlando, FL

Date	NIST Staff	Event Title	Time	Location
12-Mar-12	Erich Grossman, Richard Chamberlin	Long-Wave IR and Passive Wideband Submillimeter Wave Imagery of Static Indoor Scenes	10:35am	Room 308C
13-Mar-12	Lane Sander, Catherine A. Rimmer, Karen Williams Phinney, Melissa Phillips, Johanna Camara, Mary Bedner	Use of Isotope Dilution Mass Spectrometry Methods in the Certification of Food and Dietary Supplement Standard Reference Materials	9:00am	Room 209A
13-Mar-12	George Rhoderick, Walter Miller, Mike Kelley, Gerald Mitchell, Jennifer Carney, Franklin Guenther	Certification of Green House Gases in Atmospheric Gas Standard Reference Materials	3:55pm	Room 307B
14-Mar-12	Catherine A. Rimmer and R. Kenneth Marcus	Introductory Remarks - Addressing Challenges in Dietary Supplement Analysis	8:00am	Room 313
14-Mar-12	Melissa Phillips	Challenges in the Certification of Dietary Spplement Standard Reference Materials	8:40am	Room 313
14-Mar-12	Michele Schantz, Lane Sander, Katherine E. Sharpless, Stephen A. Wise	Fatty Acid Methods and Measurements	10:40am	Room 313
15-Mar-12	Catherine A Rimmer, Melissa M. Phillips, Laura J. Wood, Katrice A. Lippa, David L. Duewer, Stephen A. Wise, Lane Sander, Katherine E. Sharpless	NIST Dietary Supplement Laboratory Assurance Program: The First Five Years	8:40am	Room 307D
15-Mar-12	Karen Williams Phinney, Lane Sander, Michele Schantz, Katherine E. Sharpless, Stephen A. Wise	Development of Reference Materials for Nutritional Biomarkers	8:20am	Room 209A
15-Mar-12	William MacCrehan	Development of Trace Terrorist Explosives Simulants for the Detection of Semtex	9:35am	Room 209A
15-Mar-12	Jacolin A. Murray, Michele Schantz	POSTER: Quantification of Parent and Alkyl Polycyclic Aromatic Hydrocarbons in Crude Oil Samples Using Comprehensive Two-Dimensional Gas Chromatography	10:00am-2:30pm	Blue Area Expo Floor
15-Mar-12	Paul C. Derose, Aaron Urbas	POSTER: High Accuracy Fluorescence Measurements and Standards in the Near Infra-Red (NIR) 800 nm to 1600 nm	10:00am-2:30pm	Red Area Expo Floor
15-Mar-12	Gary W. Kramer	Introductory Remarks - Getting Started with AnIML 1.0	2:00pm	Room 313
15-Mar-12	Elisabeth Mansield, Kavita Jeerage	Tissue Scaffold Constructs as a Branch Between *In vitro* and *In vivo* Studies for Nanoparticle Toxicity Studies	4:15pm	Room 311A
15-Mar-12	W. Clay Davis	Standard Reference Materials for Elemental Speciation Measurements and Environmental Monitoring Studies	2:20pm	Room 311B
15-Mar-12	Stephen Long, W. Clay Davis, Julien Malherbe, John Sieber, Stuart Nagourney, Brian Buckley	Development and Certification of Standard Reference Materials for Hexavalent Chromium in Contaminated Soils	3:35:pm	Room 311B
15-Mar-12	Mary Bedner, Lane Sander, Katherine E. Sharpless	Development of an LC-MS Method for Determining Isoflavones in Soy Standard Reference Materials	2:20pm	Room 209B
15-Mar-12	Elisabeth Mansfield	Determining Nanoparticle Purity and the Presence of Nanoparticle Surface Coatings through Microscale TGA	3:00pm	Room 307A

Renewals

Popular Low-Alloy, High-Silicon Steel SRMs Upgraded and Back in Stock

The National Institute of Standards and Technology has completed the analyses needed to put SRM 125b Low-Alloy, High-Silicon Steel back into stock and to upgrade the certificates for both chip-form SRM 125b and its solid-form counterpart SRM 1134 to current standards for contents and format under the NIST Quality System. New determinations by X-ray fluorescence spectrometry (XRF) were included in re-evaluation of all certified and reference values, which now have the required estimates of uncertainty. SRMs 125b and 1134 now have certified and reference values for 11 elements including silicon at a mass fraction of 2.889 % and carbon at 0.0261 %.

When low-carbon steel is alloyed with small amounts of silicon, the silicon increases the electrical resistivity, making the steel useful for transformer cores and rotor/stator parts in electric motors. Silicon steels are of greatest use to designers of motion control products where the additional cost is justified by increased performance. These steels are available in an array of grades and thicknesses so the amount of silicon in the material may be tailored for various applications.

These two SRMs were issued in 1970 and have been serving the steel industry for over 40 years. They are used by steel manufacturers and testing laboratories in the United States and around the world. Typically, they are used to calibrate or validate test methods for XRF and spark source optical emission spectrometry (SSOES) for use with solid-form samples, or inductively coupled plasma spectrometry and combustion with infrared detection test methods for chip-form material.

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Renewals (continued)

SRM 723e Tris(hydroxymethyl)aminomethane ($HOCH_2$)

SRM 900a Antiepilepsy Drugs in Frozen Human Serum

SRM 1588c Organics in Fish Oil

SRM 1674b Carbon Dioxide in Nitrogen (Nominal Amount-of-Substance Fraction – 7 % mol/mol)

SRM 1849a Infant/Adult Nutritional Formula

SRM 2092 Low-Energy Charpy V-Notch Impact Specimen

SRM 2096 High-Energy Charpy V-Notch Impact Specimen

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. If you do not have the current certificate for your material, you can print or view a copy at our website at **http://www.nist.gov/srm** or contact the Measurement Services Division at:

Phone: 301-975-2200 **Fax:** 301-926-4751 **Email**: srminfo@nist.gov

SRM 674b X-Ray Powder Diffraction Intensity Set
Editorial changes

SRM 909c Human Serum
Editorial changes

SRM 924a Lithium Carbonate
New expiration date: 01 May 2022
Editorial changes

SRM 1021 Glass Beads – Particle Size Distribution
Editorial changes

SRM 1473b Low-Density Polyethylene Resin
New expiration date : 01 January 2019
Editorial changes

SRM 1648a Urban Particulate Matter
Editorial changes

SRM 1662a Sulfur Dioxide in Nitrogen (Nominal Amount-of-Substance Fraction – 1000 µmol/mol) Lot #93-H-XX
New expiration date: 23 September 2019
Editorial changes

SRM 1768 High-Purity Iron
Editorial changes

SRM 1849a Infant/Adult Nutritional Formula
Editorial changes

SRM 1918 Mercury Porosimeter Intrusion Standard
New expiration date: 01 December 2020
Editorial changes

Revisions (continued)

SRM 1941b Organics in Marine Sediment
New expiration date: 01 October 2020
Editorial changes

SRM 1985 Thermal Spray Powder – Particle Distribution Tungsten Carbide/Cobalt (Spheroidal)
New expiration date: 31 August 2020
Editorial changes

SRM 2783 Air Particulate on Filter Media
Editorial changes

SRM 2810 Rockwell C Hardness, Low Range
New expiration date: 31 December 2020
Editorial changes

SRM 2811 Rockwell C Hardness, Mid Range
New expiration date: 31 December 2020
Editorial changes

SRM 2812 Rockwell C Hardness, High Range
Editorial changes

SRM 2841 Semiconductor Thin Film: $Al_xGa_{1-x}As$ Epitaxial Layers
New expiration date: 01 August 2021
Editorial changes

SRM 2842 Semiconductor Thin Film: $Al_xGa_{1-x}As$ Epitaxial Layers
New expiration date: 01 August 2021
Editorial changes

SRM 3106 Bismuth (Bi) Standard Solution
New expiration date: 11 May 2017
Editorial changes

SRM 3107 Boron (B) Standard Solution
Editorial changes

SRM 3108 Cadmium (Cd) Standard Solution
Editorial changes

Revisions (continued)

SRM 3110 Cerium (Ce) Standard Solution
Editorial changes

SRM 3113 Cobalt (Co) Standard Solution
New expiration date: 11 May 2018
Editorial changes

SRM 3114 Copper (Cu) Standard Solution
Editorial changes

SRM 3116a Erbium (Er) Standard Solution
New expiration date: 24 July 2017
Editorial changes

SRM 3122 Hafnium (Hf) Standard Solution
Editorial changes

SRM 3127a Lanthanum (La) Standard Solution
New expiration date: 01 July 2017
Editorial changes

SRM 3132 Manganese (Mn) Standard Solution
Editorial changes

SRM 3133 Mercury (Hg) Standard Solution
Editorial changes

SRM 3134 Molybdenum (Mo) Standard Solution
Editorial changes

SRM 3136 Nickel (Ni) Standard Solution
Editorial changes

SRM 3137 Niobium (Nb) Standard Solution
Editorial changes

SRM 3138 Palladium (Pd) Standard Solution
Editorial changes

SRM 3140 Platinum (Pt) Standard Solution
Editorial changes

SRM 3143 Rhenium (Re) Standard Solution
Editorial changes

Revisions (continued)

SRM 3144 Rhodium (Rh) Standard Solution
Editorial changes

SRM 3150 Silicon (Si) Standard Solution
Editorial changes

SRM 3151 Silver (Ag) Standard Solution
New expiration date: 11 May 2017
Editorial changes

SRM 3154 Sulfur (S) Standard Solution
Editorial changes

SRM 3155 Tantalum (Ta) Standard Solution
Editorial changes

SRM 3156 Tellurium (Te) Standard Solution
Editorial changes

SRM 3158 Thallium (Tl) Standard Solution
New expiration date: 11 May 2017
Editorial changes

SRM 3162a Titanium (Ti) Standard Solution
Editorial changes

SRM 3163 Tungsten (W) Standard Solution
Editorial changes

SRM 3164 Uranium (U) Standard Solution (Radioactive)
Editorial changes

SRM 3166A Ytterbium (Yb) Standard Solution
Editorial changes

SRM 3169 Zirconium (Zr) Standard Solution
Editorial changes

SRM 3177 Mercuric Chloride Standard Solution
Editorial changes

SRM 3181 Sulfate Anion (SO_4^{2-}) Standard Solution
Editorial changes

Revisions (continued)

SRM 3182 Chloride Anion (Cl^-) Standard Solution
Editorial changes

SRM 3183 Fluoride Anion (F^-) Standard Solution
Editorial changes

SRM 3184 Bromide Anion (Br^-) Standard Solution
Editorial changes

SRM 3185 Nitrate Anion (NO_3^-) Standard Solution
Editorial changes

SRM 3186 Phosphate Anion (PO_4^{3-}) Standard Solution
Editorial changes

SRM 3280 Multivitamin/Multielement Tablets
Editorial changes

SRM 3287 Blueberry (Fruit)
Editorial changes

RM 8544 NBS19 Limestone
Editorial changes

RM 8545 LSVEC (Carbon, Oxygen, and Lithium Isotopes in Carbonate)
Updated reference values
Editorial changes

ORDER NIST SRMs ONLINE

You can now order NIST SRMs through our new online ordering system, which is continually updated. **PLEASE NOTE:** Purchase orders and credit cards may be used when ordering an SRM online. This system is efficient, user-friendly, and secure. Our improved search function finds keywords on SRM detail pages as well as words in titles.

Also note that we are placing many historical archive certificates online for your convenience.

https://srmors.nist.gov

Please Register Your Certificate Online!

Registering will ensure that you have the most recent certificates.

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

NIST SRM 2012 Exhibit Schedule

The Minerals, Metals, and Material Society (TMS 2012)
March 11 – 14, 2012
Walt Disney Swan & Dolphin Resort
Orlando, FL

The Pittsburgh Conference (PITTCON)
March 12 – 15, 2012
Orange County Convention Center
Orlando, FL

Measurement Science Conference/ITS9
March 19 – 23, 2012
Disney Convention Center
Anaheim, CA

American Chemical Society Spring Meeting
March 25 – 27, 2012
San Diego Convention Center
San Diego, CA

Materials Research Society Spring Meeting (MRS)
April 9 – 12, 2012
Moscone West
San Francisco, CA

Analytica 2012
April 16 – 20, 2012
New Munich Trade Fair Center
Munich, Germany

Medical Design & Manufacturing (MD&M)
May 22 – 24, 2012
Pennsylvania Convention Center
Philadelphia, PA

IFT - Food Expo
June 26 – 28, 2012
Las Vegas Convention Center
Las Vegas, NV

AACC Clinical Lab Expo
July 15 – 19, 2012
Los Angeles Convention Center
Los Angeles, CA

NCSLI Symposium
July 29 – August 1, 2012
Sacramento Convention Center
Sacramento, CA

American Chemical Society Fall Meeting
August 19 – 23, 2012
Pennsylvania Convention Center
Philadelphia, PA

AOAC International
September 30 – October 3, 2012
Planet Hollywood
Las Vegas, NV

Materials Science & Technology Conference
October 7 – 11, 2012
David L. Lawrence Conference Center
Pittsburgh, PA

Material Research Society Fall Meeting (MRS)
November 26 – 29, 2012
Hynes Convention Center
Boston, MA

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

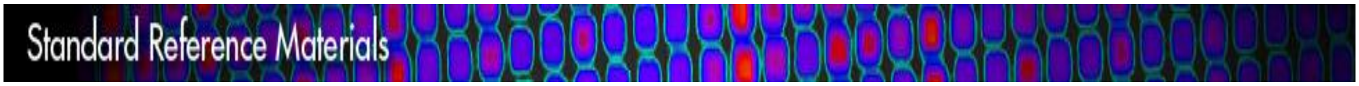
For Internet Explorer

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

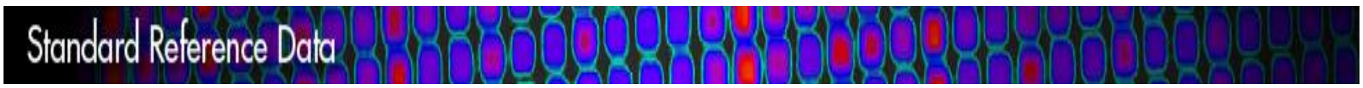
1) Go to Tools > Internet Options
2) Click on the Advanced tab
3) Scroll down to Security
3) Make sure that both SSL 3.0 and TLS 1.0 are checked

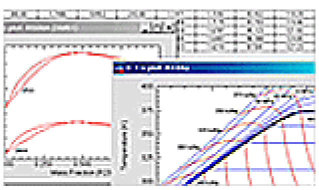
NIST Measurement Services Websites of Interest



Standard Reference Materials
www.nist.gov/srm

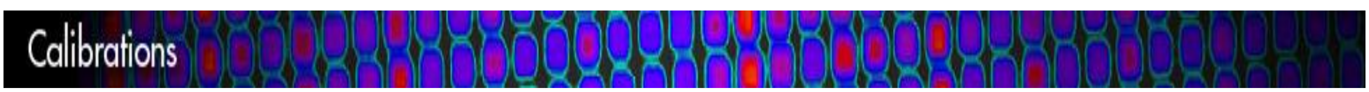
Historical Archived Certificates/Reports of Investigation
https://www-s.nist.gov/srmors/certArchive.cfm





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

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



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