New and Renewal NIST SRMs/RMs

NIST SRM 1728 Tin Alloy (Sn-3Cu-0.5Ag) Supports Testing of Lead-Free Solder

Standard Reference Material (SRM) 1728 Tin Alloy (Sn-3Cu-0.5Ag) is the first lead-free solder composition issued by the National Institute of Standards and Technology. The SRM provides certified and reference values for bulk composition of the restricted elements Cr, Cd, Hg, and Pb, plus elements As and Sb, which are elements of concern. Also provided are values for the alloying elements Cu and Ag, plus other elements that may be found in scrap and may have deleterious effects on solder alloy performance, including S, Fe, Co, Ni, In, and Bi. Information values are provided for the elements Al, P, Si, and Zn.

Solder alloys are tested using methods based on X-ray fluorescence spectrometry, inductively-coupled plasma optical emission spectrometry, and other common instrumental elemental analysis techniques. Committees of ASTM International and the International Electrotechnical Congress are developing standard test methods that will use NIST SRM 1728 and several other NIST tin alloy SRMs for validation. The other SRMs are SRMs 1727 Anode Tin and SRM 1729 Tin Alloy (97Sn-3Pb).

SRM 1728, issued in disk form, was developed in collaboration with MBH Analytical commercial supplier of certified reference materials, and Universal Scientific Laboratory Pty., Ltd., Milperra, Australia, which created the alloy using a semi-chill casting process to ensure homogeneity of the disks to a depth of at least 10 mm.

Semi-chill cast disks of SRM 1728 showing various stages in manufacturing and testing.

Technical Contact: John Sieber
Email: john.sieber@nist.gov
NIST SRM 2377 Fatty Acid Methyl Esters in 2,2,4-Trimethylpentane

NIST has released Standard Reference Material 2377 Fatty Acid Methyl Esters in 2,2,4-Trimethylpentane. This SRM is intended primarily for use in the calibration of chromatographic instrumentation, but it can also be used in spiking solutions for fortification of samples, in studying extraction recoveries, for developing chromatographic separations, and as authentic standards for identifying constituents in unknown samples.

Efforts at NIST to provide SRMs to support the measurement of fatty acids began in the mid-1990s after the U.S. Congress passed the Nutrition Labeling and Education Act, which mandated specifications for the labeling of processed foods. This law requires (in part) that saturated and unsaturated fatty acid content be reported on nutrition labels. Reference materials with fatty acid data are needed to underpin the measurements of chemical composition upon which the labeling is based. NIST provides nearly thirty complex-matrix SRMs that are characterized for fatty acid composition. These materials are intended primarily for use as control materials and for the development of new analytical methods. The use of complex-matrix reference materials for instrument calibration is not recommended; solution calibrants are better suited to this task.

To fill the need for a solution-based reference material, SRM 2377 consists of five 2 mL ampoules, each containing approximately 1.2 mL of a solution containing 26 individual fatty acid methyl esters (FAMEs). The SRM was formulated using FAMEs, rather than the underivatized fatty acids, for user convenience and to enhance solution stability. These compounds include short- and long-chain length and saturated- and unsaturated-FAMEs. Omega-3 and omega-6 FAMEs were included to support characterization of functional foods, such as botanical and fish oils, that are high in levels of the corresponding fatty acids. SRM 2377 is relevant to a broad spectrum of applications including compliance with and accuracy of nutritional labeling, food manufacturing tolerances (e.g., infant formulas), traceability of measurements for food exports, clinical nutritional measurements, and characterization of alternative energy sources (e.g., biodiesel).

Technical Contacts: Michele Schantz, Lane Sander
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Email: lane.sander@nist.gov
NIST SRM 2906 Trace Explosives Calibration Solutions and ASTM E 2520-07: NIST/ASTM Land a One-Two Punch to Fight Explosives Terrorism

NIST is now offering SRM 2906 Trace Explosives Calibration Solutions so that the performance and reliability of trace-explosives detectors (TEDs) can be independently evaluated. TEDs are an increasingly common sight at airports and loading docks and are carried by firefighters and police to evaluate suspicious packages.

SRM 2906 provides the materials required by a consensus standard protocol for testing TEDs from ASTM International. ASTM E 2520-07, Standard Practice for Verifying Minimum Acceptable Performance of Trace Explosive Detectors, uses calibration solutions of three high explosives: RDX (an ingredient in Composition C-4), PETN (Semtex), and TNT (a military explosive). NIST researchers determined the concentrations of these solutions so they provide an alarm response in well-functioning TEDs. The specified solutions are near, but above, the detection limit of commercial swipe-type detectors, commonly based on ion mobility spectrometry (IMS). In the ASTM protocol, a single drop of explosive solution and a solvent blank are sequentially applied to swipes, the solvents are allowed to evaporate, and the instrument is tested. A simple “yes-no” alarm checklist determines TED performance. Four ampoules of each of the three explosives and blank are provided along with a dropper bottle for each.

This SRM provides independent test materials with low uncertainties in concentration for reliable TED evaluation. Equipment vendors may use the SRM to optimize their designs and demonstrate detector functions to customers. Buyers may use the SRM to make informed equipment selection. The combination of a validated standard practice from ASTM and an SRM provides TED users with a reliable means of verifying initial and continuing field performance of their equipment and contribute to the fight against explosives terrorism. This SRM was produced with partial support from the Office of Standards at the Department of Homeland Security.

Technical Contact: William MacCrehan
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Development and Certification of Green Tea-Containing SRMs

NIST SRM 3254 *Camellia sinensis* (Green Tea) Leaves
NIST SRM 3255 *Camellia sinensis* (Green Tea) Extract
NIST SRM 3256 Green Tea-Containing Solid Oral Dosage Form

A suite of three green tea-containing Standard Reference Materials (SRMs) has been issued as part of a multi-agency effort to support the chemical analysis of dietary supplements. NIST collaborated with the National Institutes of Health, Office of Dietary Supplements and the Food and Drug Administration to develop SRM 3254 *Camellia sinensis* (Green Tea) Leaves, SRM 3255 *Camellia sinensis* (Green Tea) Extract, and SRM 3256 Green Tea-Containing Solid Oral Dosage Form. These SRMs are the first certified reference materials specifically designed to support the measurement of catechins and alkaloids in green tea.

Tea (*Camellia sinensis* L.) has been consumed in some cultures for centuries. Increased interest in this beverage has resulted from perceived health benefits that may be associated with its consumption, and it is now commonly used in dietary supplement formulations. The latter materials are typically marketed as aids for weight loss and as stimulants to promote energy; they are also advertised as exhibiting antioxidant properties. A class of compounds known as catechins are present at high levels (approximately 10% to 15% by mass) in green tea leaves and dietary supplement formulations, and at even higher levels in commercial extracts (75% by mass). Extracts of *C. sinensis* are typically used in the manufacture of dietary supplements to achieve product consistency and greater potency.

A unit of each of the SRMs consists of five single-use packets that contain approximately 1 g to 3 g of powdered material that is characterized for catechins, caffeine and other xanthine alkaloids, theanine, and toxic elements. The materials are intended primarily for use in validating analytical methods and for quality assurance when assigning values to in-house control materials.

These materials were developed as suites to provide a close match for different types of sample matrices. The SRMs are not intended to be archetypes for new product formulations, but instead may provide analytical challenges similar to those encountered by the analyst. By providing SRMs with known composition, a major source of measurement uncertainty is eliminated, leading to improved measurement accuracy.

*Technical Contacts: Lane C. Sander, Katherine Sharpless*
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*Email: katherine.sharpless@nist.gov*
RELEASE OF RENEWAL SRM 968e FAT-SOLUBLE VITAMINS, CAROTENOIDS, AND CHOLESTEROL IN HUMAN SERUM

SRM 968e Fat-Soluble Vitamins, Carotenoids, and Cholesterol in Human Serum replaces SRM 968d, which consisted of a single serum pool. This SRM consists of three sera pools that contain natural levels of fat-soluble vitamins, carotenoids and cholesterol in a human serum matrix. The value assignment of the analytes in this SRM supports measurement accuracy and traceability for laboratories performing health-related measurements in the clinical and nutritional communities.

Certified values are provided for total retinol, gamma-tocopherol, alpha-tocopherol, lutein, zeaxanthin, beta-crytoxanthin, total beta-carotene and cholesterol. Reference values are provided for trans- and total lycopene, total alpha-carotene and trans-beta-carotene. For the production of SRM 968e, retinol, gamma- and alpha-tocopherol, and carotenoids were measured at NIST over a period of several months in tubes of plasma obtained from more than 100 individual units at the time of plasmapheresis. Blending protocols were then specified to result in three sera pools containing target concentration levels. To ensure the homogeneity of all levels in SRM 968e and to address issues of commutability, SRM 968e was produced without supplementing (spiking) any analyte. SRM 968e is used extensively by laboratories worldwide primarily to validate methods for determining these analytes in human serum and plasma and for assigning values to in-house control materials.

The Certificate of Analysis for SRM 968e can be viewed at:
https://www-s.nist.gov/srmors/view_detail.cfm?srm=968E

Technical Contact: Jeanice Brown Thomas
Email: jeanine.brownthomas@nist.gov
## NIST Speakers at PITTCON 2011
Atlanta, GA March 13-18 2011
Atlanta World Congress Center

<table>
<thead>
<tr>
<th>DATE</th>
<th>NIST STAFF</th>
<th>EVENT TITLE</th>
<th>TIME</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/13/2011</td>
<td>Gary W. Kramer</td>
<td>Workshop arranged by Gary W. Kramer - Implementing AnIML 1.0</td>
<td>1:00pm</td>
<td>Rm 408</td>
</tr>
<tr>
<td>3/13/2011</td>
<td>Gary W. Kramer</td>
<td>What AnIML is Not</td>
<td>1:30pm</td>
<td>Rm 408</td>
</tr>
<tr>
<td>3/14/2011</td>
<td>Karen W. Phinney</td>
<td>Workshop arranged by Karen W. Phinney - Analytical Chemistry and the Population:Ensuring the Quality of Biomarker Data in Long-Term Population Studies</td>
<td>8:00am</td>
<td>Rm 409</td>
</tr>
<tr>
<td>3/14/2011</td>
<td>Catherine A. Rimmer</td>
<td>Reference Materials in Everyday Measurements</td>
<td>10:40am</td>
<td>Rm 409</td>
</tr>
<tr>
<td>3/15/2011</td>
<td>Paul C. DeRose, Neeti Goel, Sandra Da Silva</td>
<td>POSTER Identification and Quantitation of Bacillus Spores Using Fluorescence Detection</td>
<td>10:00am</td>
<td>Red Area, Hall B, Aisle 400</td>
</tr>
<tr>
<td>3/16/2011</td>
<td>Elisabeth Mansfield, Stephanie Hooker, Aparna Kar</td>
<td>Microscale Thermogravimetric Analysis of Carbon Nanotube Purity</td>
<td>8:20am</td>
<td>Rm 408</td>
</tr>
<tr>
<td>3/16/2011</td>
<td>Karl Selby</td>
<td>Monitoring Nanoparticle Stability in Biological Conditions Using Time Dependent Dynamic Light Scattering</td>
<td>10:15am</td>
<td>Rm 405</td>
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<tr>
<td>3/16/2011</td>
<td>Gas Metrology Group</td>
<td>NTRM Producers Meeting</td>
<td>1:30-4:00p</td>
<td>Hilton Garden Inn Atlanta Downtown 275 Baker St</td>
</tr>
<tr>
<td>3/16/2011</td>
<td>Adrian Verwolf</td>
<td>Design and Optimization of a Permeation Testing System for Biocompatible Polymer Films</td>
<td>10:00am</td>
<td>Red Area, Hall B Aisle 400</td>
</tr>
<tr>
<td>3/17/2011</td>
<td>William MacCrehan</td>
<td>Workshop arranged by Jose R Amirall and William MacCrehan - New Developments in Forensic Science:Analytical Chemistry Comes to the Crime Scene</td>
<td>8:00am</td>
<td>Rm309</td>
</tr>
<tr>
<td>3/17/2011</td>
<td>Greg Gillen</td>
<td>Optimized Sampling and Analysis Strategies for Trace Contraband Detection - Explosives and Norcotics</td>
<td>10:35am</td>
<td>Rm309</td>
</tr>
<tr>
<td>3/17/2011</td>
<td>Ashley Beasley, David Bunk, Karen W. Phinney</td>
<td>POSTER Development of a Reference Measurement Procedure to Quantify Urinary Albumin</td>
<td>10:00am</td>
<td>Red Area, Hall B Aisle 400</td>
</tr>
</tbody>
</table>
NIST Speakers at PITTCON 2011  Atlanta, GA March 13-18 2011
Atlanta World Congress Center  (continued)

<table>
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<tbody>
<tr>
<td>3/17/2011</td>
<td>Eric Windsor, Greg Gillen, Marcela Najarro</td>
<td>POSTER Use of Inkjet Printing Technology to Produce Test Materials for Trace Explosive Analysis</td>
<td>10:00am</td>
<td>Red Area, Hall B Aisle 400</td>
</tr>
<tr>
<td>3/17/2011</td>
<td>Samuel Martin Stavis</td>
<td>Three-dimensional Nanofluidic Metrology</td>
<td>3:50pm</td>
<td>Rm309</td>
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<tr>
<td>3/17/2011</td>
<td>Gerald D. Mitchell, Stephen E. Long, Jeff Ryan</td>
<td>Si Traceability of the Output Concentration of Mercury Vapor Generators</td>
<td>3:55pm</td>
<td>Rm405</td>
</tr>
<tr>
<td>3/17/2011</td>
<td>Melissa M. Phillips, Lane C. Sander, Katherine E. Sharpless, Stephen A. Wise</td>
<td>Determination of Water-Soluble Vitamins in Food-Matrix SRMs</td>
<td>2:20pm</td>
<td>Rm218</td>
</tr>
<tr>
<td>3/17/2011</td>
<td>Thomas W. Vetter, Savelas A. Rabb, Ryan G. Brennan, Karen E. Murphy, Stephen E. Long</td>
<td>Determination of Electrolytes in Human Serum:Comparison of Results for Ion-exchange Separated Samples and Non-separated Samples</td>
<td>3:00pm</td>
<td>Rm404</td>
</tr>
<tr>
<td>3/17/2011</td>
<td>Jennifer Carney, George Rhoderick, Walter Miller</td>
<td>The NIST Atmospheric Methane Gas Standard Scale</td>
<td>3:00pm</td>
<td>Rm408</td>
</tr>
</tbody>
</table>
Renewals

SRM 909c  Human Serum
SRM 968e  Fat Soluble Vitamins, Carotenoids, and Cholesterol in Human Serum
SRM 2092  Low-Energy Charpy
SRM 2096  High-Energy Charpy
SRM 2692c Bituminous Coal (Sulfur, Mercury and Chlorine)
SRM 2771  Sulfur in Diesel Fuel Blend Stock
SRM 4288b Technetium-99 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 SRMs 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 154c Titanium Dioxide
New expiration date:  31 December 2020
Editorial changes

SRM 1007b Smoke Density Chamber Standard
Technical changes

SRM 1566b Oyster Tissue
Editorial changes

SRM 1621e Sulfur in Residual Fuel Oil (1 %)
New expiration date:  01 July 2016
Editorial changes

SRM 1661a Sulfur Dioxide in Nitrogen (Nominal 500 µmol/mol)
New expiration date:  15 January 2017
Editorial changes
Revisions (continued)

SRM 1686b Nitric Oxide in Nitrogen (Nominal 500 µmol/mol)
New expiration date: 07 January 2018

SRM 1917 Mercury Porosimetry Standard
New expiration date: 01 October 2020
Editorial changes

SRM 1955 Homocysteine and Folate in Human Serum
New expiration date: 31 December 2013
Editorial changes

SRM 1984 Thermal Spray Powder – Particle Size Distribution Tungsten Carbide/Cobalt (Acicular)
New expiration date: 08 August 2015
Editorial changes

SRM 2241 Relative Intensity Correction Standard for Raman Spectroscopy : 785 nm Excitation
New expiration date: 30 November 2015
Editorial changes
Recertification

SRM 2583 Trace Elements in Indoor Dust Nominal 90 mg/kg Lead
New expiration date: 31 December 2015
Editorial changes

SRM 2584 Trace Elements in Indoor Dust (Nominal 1 % Lead)
New expiration date: 31 December 2015
Editorial changes

SRM 2687 Portland Cement Clinker
Editorial changes

SRM 2745 Carbon Dioxide in Nitrogen (Nominal Amount-of-Substance Fraction – 16 % mol/mol)
Lot #9-C-XX
New expiration date: 02 June 2017
Editorial changes

SRM 3118a Gadolinium (Gd) Standard Solution
Lot #992004
New expiration date: 12 May 2016
Editorial changes

SRM 3191 Aqueous Electrolytic Conductivity
New expiration date: 05 June 2011
Revisions (continued)

SRM 4926e Hydrogen 3 Radioactivity Standard
Editorial changes

RM 8506a Water in Transformer Oil
New expiration date: 31 December 2018
Editorial changes

RM 8642 FDA Saxitoxin Dihydrochloride Solution
New expiration date: 01 July 2013
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.

January 2011 Standard Reference Materials®
Catalog/CD

If you would like a copy of our new January 2011 SRM Marketing Catalog or a CD, please call, fax, or email us at:

Ph: 301-975-2200
Fax: 301-948-3730
Email: srminfo@nist.gov
# NIST SRM 2011 Exhibit Schedule

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<tr>
<th>Event</th>
<th>Dates</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Electronic Materials and Applications (EMA)</td>
<td>January 19-21, 2011</td>
<td>Royal Plaza Walt Disney World Resort Orlando, FL</td>
</tr>
<tr>
<td>American Academy for Forensic Science (AAFS)</td>
<td>February 23 – 25, 2011</td>
<td>Hyatt Regency Chicago, IL</td>
</tr>
<tr>
<td>Pittsburgh Conference (PITTCON)</td>
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<tr>
<td>March 13 – 18, 2011</td>
<td>Georgia World Congress Center Atlanta, GA</td>
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<tr>
<td>American Chemical Society (ACS)</td>
<td>March 27 – 31, 2011</td>
<td>Anaheim Convention Center Anaheim, CA</td>
</tr>
<tr>
<td>Materials Research Society Spring Meeting (MRS)</td>
<td>April 25 – 29, 2011</td>
<td>Moscone West San Francisco, CA</td>
</tr>
<tr>
<td>Clearwater Clean Coal Conference</td>
<td>June 5-9, 2011</td>
<td>Sheraton Sand Key Clearwater, FL</td>
</tr>
<tr>
<td>IFT – Food Expo</td>
<td>June 12- 14, 2011</td>
<td>New Orleans Morial Convention Center New Orleans, LA</td>
</tr>
<tr>
<td>ISO/REMCO 34th Meeting</td>
<td>July 11-15, 2011</td>
<td>Delft, Netherlands</td>
</tr>
<tr>
<td>AACC Clinical Lab Expo</td>
<td>July 26-28, 2011</td>
<td>Georgia World Congress Center Atlanta, GA</td>
</tr>
<tr>
<td>NCSL Symposium</td>
<td>August 21-25, 2011</td>
<td>Gaylord Natl. Convention Center National Harbor, MD</td>
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<tr>
<td>Dioxin 2011</td>
<td>August 21-25, 2011</td>
<td>Brussels, Belgium</td>
</tr>
<tr>
<td>American Chemical Society (ACS)</td>
<td>August 28-September1, 2011</td>
<td>Denver Convention Center Denver, CO</td>
</tr>
<tr>
<td>AOAC International</td>
<td>September 18-21, 2011</td>
<td>Sheraton New Orleans New Orleans, LA</td>
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<tr>
<td>MS&amp;T Show</td>
<td>October 16-20, 2011</td>
<td>Greater Columbus Convention Center Columbus, OH</td>
</tr>
<tr>
<td>Air Quality VIII</td>
<td>October 24-27, 2011</td>
<td>Marriott Crystal Gateway Arlington, VA</td>
</tr>
<tr>
<td>ChemShow</td>
<td>November 1-3, 2011</td>
<td>Jacob Javits Convention Center New York City, NY</td>
</tr>
<tr>
<td>Material Research Society Fall Meeting (MRS)</td>
<td>November 28-December 2, 2011</td>
<td>Hynes Convention Center Boston, MA</td>
</tr>
</tbody>
</table>
IMPORTANT MESSAGE when 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
Other 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

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

Please take the time to rate our products:

We appreciate your feedback!