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Editor: Regina R. Montgomery

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**IMPORTANT MESSAGE
WHEN ACCESSING THE
SRM WEBSITE**

The identification of any commercial product or trade name does not imply endorsement or recommendation by the National Institute of Standards and Technology.

New NIST SRMs

NIST SRM 3177 Mercury (II) Chloride Standard Solution

It is now recognized globally that mercury emissions to the environment can ultimately pose a serious risk to human health through dietary exposure to methylmercury in fish and shellfish. Environmental regulations are now being enacted that are designed to control atmospheric emissions of mercury, especially from coal-fired power utilities, the largest single anthropogenic source. This will require accurate stack gas monitoring for both elemental Hg and HgCl₂ (oxidized mercury), the two principal species which are emitted. Accurate monitoring of these species will require traceability to primary standards. Although SRM 3133 Mercury Standard Solution, has been available as a general-purpose primary calibration standard for some time, there is now an important need for a complementary standard to provide calibration and traceability support for oxidized mercury measurements and the calibration of oxidized mercury measurement instrumentation.

To meet this need, NIST, in collaboration with the U.S. Environmental Protection Agency (EPA), has produced a new SRM Standard Solution for mercury (SRM 3177) which was prepared from high-purity mercury (II) chloride. A unit of this material consists of five borosilicate glass ampoules, with each ampoule containing approximately 10 mL of solution. A certified value is assigned for mercury, with a nominal mass fraction of 1 mg/g.

*Technical Contact: Stephen Long
Email: stephen.long@nist.gov*



NIST RM 8642 Saxitoxin Dihydrochloride Solution

In collaboration with the U.S. Food and Drug Administration (FDA), NIST has released RM 8642 FDA Saxitoxin Dihydrochloride Solution. For more than 40 years, FDA has provided a saxitoxin dihydrochloride material to state shellfish laboratories and others who monitor seafood safety. The material is used to calibrate the mouse bioassay used in AOAC International Official Method 959.08 Paralytical Shellfish Poison, which is the standard method used for monitoring toxicity of shellfish. Paralytic shellfish poisoning (PSP) results from eating seafood that has been contaminated by algae that produce the toxin.

RM 8642 was prepared by FDA's Center for Food Safety and Applied Nutrition (CFSAN). The saxitoxin dihydrochloride concentration in RM 8642 is nominally 100 µg/mL in a solution of 80 % acidified water (pH 3.5) and 20 % ethanol (volume fractions). One sales unit consists of ten amber, borosilicate glass ampoules, each containing approximately 1.2 mL of solution.



Technical Contact: Katherine E. Sharpless
E-mail: katherine.sharpless@nist.gov

NIST RM 8988 Titanium Dioxide Powder - Particle Size Distribution

RM 8988 is a high-purity, titanium dioxide powder of the rutile structure, intended for use in the evaluation and calibration of equipment for measurements of particle size distributions (PSDs) in the 0.1 μm to 0.5 μm diameter range. The reference values provided in the RM are the cumulative mass distribution and particle diameter values as measured by laser light scattering (LLS) and X-ray disc centrifugation (XDC). The RM also provides the particle mass density as an additional information value. The Report of Investigation describes the materials preparation and measurement methods used to provide the reference values, along with studies investigating the effects on the PSD of assumed powder density variability, experimental measurement variables, and changes in the powder dispersion medium.

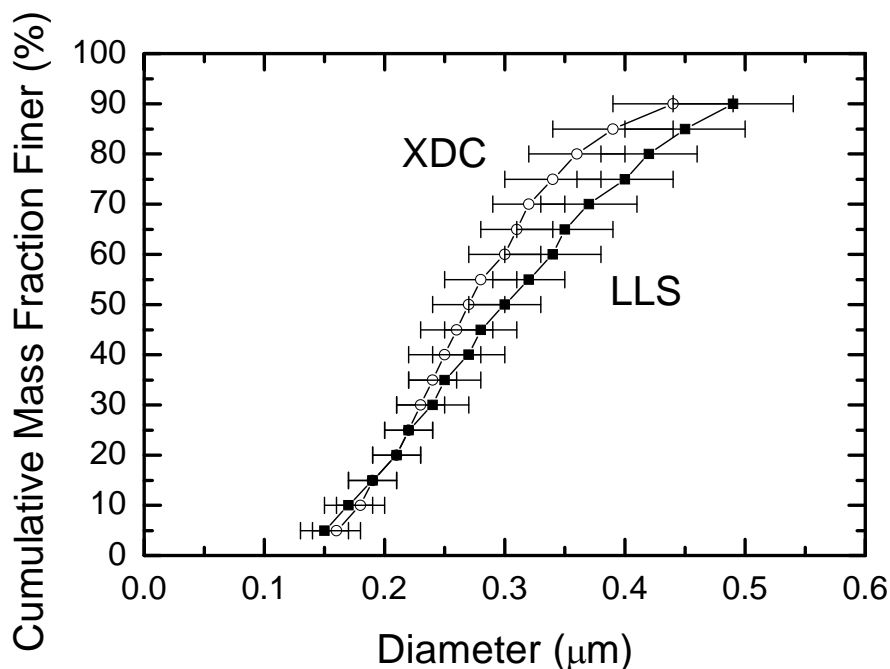
Titanium dioxide powder is widely used in products ranging from paints and coatings for buildings and vehicles to sunscreens and cosmetics for personal care. The PSD of a powder determines properties in a product, *e.g.*, the optical properties of protective coatings containing particles are strongly dependent on the particle diameter. Thus, it is important to be able to measure particle diameter and PSD accurately and precisely to attain the desired performance of a product incorporating the powder. Two of the most common methods for measuring PSD are LLS and XDC. In order to obtain accurate and precise measurements by these methods, a standard of known PSD, *e.g.*, NIST RM 8988, is required.

In the LLS measurements, the powder was dispersed in an aqueous solution and circulated through a glass cell where the particles interacted with a beam of laser light. The pattern of diffracted light resulting from the particle-light interactions was measured by an array of diode detectors. Mie light scattering theory, applicable to particles with diameters in the range of 40 nm to 2 μm , was used to convert the measured scattering pattern to a particle size distribution. Mie theory includes the influence of diffraction, refraction, reflection, and polarization effects, and requires that the real and imaginary refractive indices of the particles and the suspending medium are known, and that the particles are optically homogeneous smooth spheres. A refractive index with a real component of 2.5 and an imaginary component of 1.5 was used for the titanium dioxide powder in suspension.

XDC is a common method for particle sizing by centrifugal sedimentation that works well for particles with a density that is greater than the density of the liquid in which they are suspended. The centrifugal field imparted by a spinning disc accelerates gravitational settling of particles in the suspension being analyzed; particles of the same density separate out in a gradient based on their mass. Thus, for spherical or nearly spherical particles, the graded separation provides a means to determine the size distribution of particles in a suspension. In this technique, particle concentration is measured by an X-ray transmission method. Particle size distribution was determined by measuring the particle concentration inferred from the intensity of the transmitted X-ray beam as a function of time and radial position across the disc. During measurement, the X-ray source and detector were radially scanned across the disc and the particle diameter was

NIST RM 8988 Titanium Dioxide Powder - Particle Size Distribution (continued)

calculated using the Stokes equation for the settling of particles in laminar flow under the influence of a centrifugal field. The mass fraction of a given particle diameter was calculated from the transmitted intensity through the powder suspension normalized by the transmitted intensity of the pure suspension media.



Cumulative mass fraction of RM 8988 titania particles as a function of particle diameter measured by laser light scattering (LLS) and X-ray disc centrifugation (XDC). The median particle size is about 0.3 μm or 300 nm.

Technical Contact: Robert Cook
E-mail: robert.cook@nist.gov

Renewals

- SRM 200b** Potassium Dihydrogen Phosphate, (KH₂PO₄)
- SRM 660b** Line Position and Line Shape Standard for Powder Diffraction
- SRM 967a** Creatinine in Frozen Human Serum
- SRM 2092** Low-Energy Charpy V-Notch
- SRM 2096** High-Energy Charpy V-Notch
- SRM 2974a** Organics in Freeze-Dried Mussel Tissue (*Mytilus edulis*)
- SRM 3105a** Beryllium Standard Solution
- SRM 3138** Palladium Standard Solution
- SRM 4232e** Americium-243 Radioactivity Standard
- SRM 4330c** Plutonium-239 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 from the 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 17f Sucrose

Corrected certified values
Editorial changes

SRM 25d Manganese Ore

Revised values for all constituents
Editorial changes

SRM 90 Ferrophosphorus

Re-assessment of uncertainties
Editorial changes

Revisions (continued)

SRM 640d Silicon Powder, Line Position, and Line Shape Standard for Powder Diffraction

Technical and editorial changes

SRM 909b Human Serum

Technical and editorial changes

SRM 1619b Sulfur in Residual Fuel Oil

Technical and editorial changes

SRM 1640a Trace Elements in Natural Water

Updated certified values

Editorial changes

SRM 1658a Methane in Air (Nominal-Amount-of-Substance Fraction – 1 $\mu\text{mol/mol}$)

New expiration date: 15 September 2017

Editorial changes

SRM 1848 Lubricating Oil Additive Package

New expiration date: 01 May 2018

Editorial changes

SRM 1880b Portland Cement

Updated certified values

Editorial changes

SRM 2389 Amino Acids in 0.1 mol/L Hydrochloric Acid

New expiration date: 01 January 2011

Editorial changes

SRM 2630 Nitric Oxide in Nitrogen (Nominal Amount-of-Substance Fraction - 1500 $\mu\text{mol/mol}$)

New expiration date: 01 April 2013

SRM 2657a Oxygen in Nitrogen (Nominal Amount-of-Substance Fraction – 2 % mol/mol)

New expiration date: 01 June 2017

Editorial changes

SRM 2687 Portland Cement Clinker

New expiration date: 01 December 2015

Updated certified values

Revisions (continued)

SRM 2688 Portland Cement Clinker

New expiration date: 01 December 2015

Updated certified values

SRM 2717a Sulfur in Residual Fuel Oil (3 %)

Editorial changes

SRM 2765 Propane in Air (Nominal Amount-of-Substance Fraction – 100 nmol/mol)

New expiration date: 14 September 2017

Editorial changes

SRM 2724b Sulfur In Diesel Fuel Oil

Technical and Editorial changes

SRM 3010 Tetrachloroethene (Tetrachloroethylene)in Methanol

New expiration date: 31 January 2015

Updated certified value and

Editorial changes

SRM 3119a Gallium Standard Solution

New expiration date: 01 November 2015

Editorial changes

SRM 3145a Rubidium Standard Solution Lot #891203

New expiration date : 19 June 2015

Editorial changes

SRM 3154 Sulfur Standard Solution

New expiration date: 18 August 2015

Editorial changes

SRM 3156 Tellurium Standard Solution Lot #892901

New expiration date: 01 April 2015

Editorial changes

ORDER NIST SRMS ONLINE

You can now order NIST SRMs through our new online ordering system, which is constantly being 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 picks up keywords on the detail page along with the words in the title of each SRM.

Please also note we are adding many historical archive certificates online for your convenience.

<https://srmors.nist.gov>

Please Register Your Certificate Online!

Users of NIST SRMs should ensure that they have the most recent certificates.

<http://www.nist.gov/srd/srmregform.htm>

January 2010 Standard Reference Materials Catalog



If you would like a copy of our new January 2010 SRM Marketing Catalog, Price List, or a CD, please call, fax, or email us at:

Ph: 301-975-2200

Fax: 301-948-3730

Email: srminfo@nist.gov

NIST SRM 2010 Exhibit Schedule

**IFT – Food Expo**

July 18-20, 2010

McCormick Place South

Booth #3329

Chicago, IL

NCSL Symposium

July 25-29, 2010

Booth #625-627

Rhode Island Convention Ctr

Providence, RI

AACC Clinical Lab Expo

July 27-29, 2010

Anaheim Convention Ctr

Anaheim, CA

American Chemical Society (ACS)

August 22-26, 2010

Boston Convention and

Exhibition Ctr

Boston, MA

Dioxin 2010

September 12-17, 2010

Marriott Rivercenter

San Antonio, TX

Analytica China

September 15-17, 2010

Shanghai, China

AOAC International

September 26-29, 2010

Booth #505

Royal Pacific Resort

Orlando, FL

MS&T

October 17-21, 2010

Booth #421

George R. Brown Convention Ctr

Houston, TX

Materials Research Society Meeting

November 30-December 2, 2010

Hynes Convention Ctr

Boston, MA



IMPORTANT MESSAGE when accessing the SRM Website:
<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.

If you are using Mozilla Firefox

- 1) You must have the most current version – 3.0.5
- 2) You must enable SSL 3.0
- 3) You must enable TLS 1.0

To enable SSL 3.0 and TLS 1.0

- 1) Go to Tools – Options – Advanced
- 2) Click the encryption tab
- 3) Under Protocols, ensure that both boxes are checked

If you are using Internet Explorer

- 1) You must have the most current version – IE 6.0 or IE 7.0
- 2) You must enable SSL 3.0
- 3) You must enable TLS 1.0

To enable SSL 3.0 and TLS 1.0

- 1) Go to Tools – Internet Options – Advanced
- 2) Scroll down to security
- 3) Ensure that both SSL 3.0 and TLS 1.0 are checked

Other NIST Measurement Services Websites of Interest

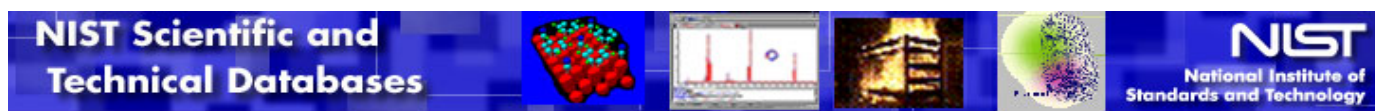


Standard Reference Materials

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://www.srdata.nist.gov/gateway>



Calibrations Services

<http://www.nist.gov/ts/msd/calibrations/index.cfm>

Please take the time to rate our products:

<http://tsapps.nist.gov/msdsurvey/Default.aspx>

We appreciate your feedback!