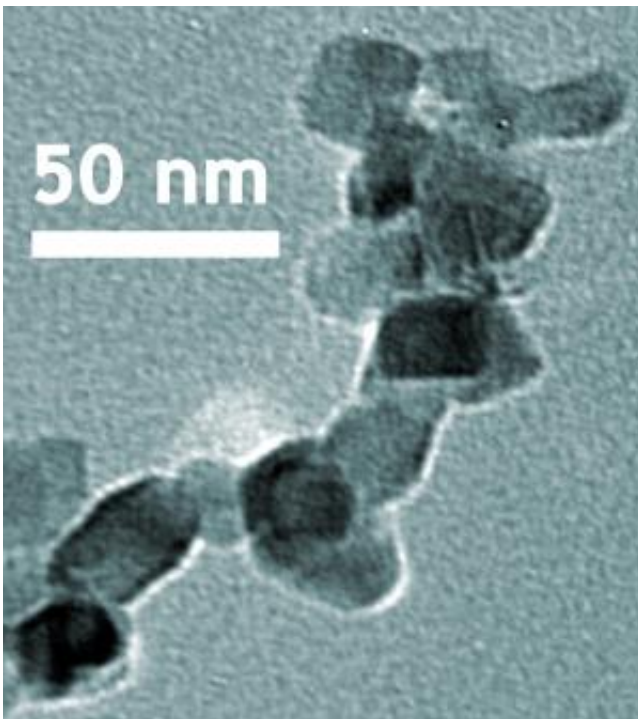


# Reference material could aid nanomaterial toxicity research

September 6 2012, by Michael Baum

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TEM image shows the nanoscale crystalline structure of titanium dioxide in NIST SRM 1898 (color added for clarity.) Credit: Impellitteri/EPA

(Phys.org)—The National Institute of Standards and Technology (NIST) has issued a new nanoscale reference material for use in a wide range of environmental, health and safety studies of industrial nanomaterials. The new NIST reference material is a sample of commercial titanium dioxide powder commonly known as "P25."

NIST Standard [Reference Materials](#) (SRMs) are typically samples of industrially or clinically important materials that have been carefully analyzed by NIST. They are provided with certified values for certain key properties so that they can be used in experiments as a known reference point.

Nanoscale titanium-dioxide powder may well be the most widely manufactured and used nanomaterial in the world, and not coincidentally, it is also one of the most widely studied. In the form of larger particles, titanium dioxide is a common white pigment. As [nanoscale particles](#), the material is widely used as a [photocatalyst](#), a sterilizing agent and an ultraviolet blocker (in sunscreen lotions, for example).

"Titanium dioxide is not considered highly toxic and, in fact, we don't certify its toxicity," observes NIST chemist Vincent Hackley. "But it's a representative industrial nanopowder that you could include in an environmental or toxicity study. It's important in such research to include measurements that characterize the nanomaterial you're studying—properties like morphology, surface area and [elemental composition](#). We're providing a known benchmark."

The new titanium-dioxide reference material is a mixed phase, nanocrystalline form of the chemical in a dry powder. To assist in its proper use, NIST also has developed protocols for properly preparing samples for environmental or toxicological studies.

The new SRM also is particularly well suited for use in calibrating and testing analytical instruments that measure specific surface area of [nanomaterials](#) by the widely used Brunauer-Emmet-Teller (BET) gas sorption method.

Additional details and purchasing information on NIST Standard

Reference Material 1898, "[Titanium Dioxide](#) Nanomaterial" are available at [www.nist.gov/srm/index.cfm](http://www.nist.gov/srm/index.cfm).

SRMs are among the most widely distributed and used products from NIST. The agency prepares, analyzes and distributes nearly 1,300 different materials that are used throughout the world to check the accuracy of instruments and test procedures used in manufacturing, clinical chemistry, environmental monitoring, electronics, criminal forensics and dozens of other fields.

See "Protocols for Measurement and Dispersion of Nanoparticles" at [www.nist.gov/mml/np-measurement-protocols.cfm](http://www.nist.gov/mml/np-measurement-protocols.cfm).

Provided by National Institute of Standards and Technology

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