Gold in the News

2005 NanoVic Prize for Gold Nanoparticle Research

Nanotechnology Victoria has announced the winners of its inaugural NanoVic Prizes for Innovation in Nanotechnology. Since its formation in 2003, Nanotechnology Victoria has proved an important catalyst in generating new nanotechnology investments, collaborations, and projects in Australia.

At the awards luncheon, a Postgraduate Prize was awarded in the field of nanobiotechnology to Alexandra Angelatos of the Centre of Nanoscience and Nanotechnology, Department of Chemical and Biomolecular Engineering, University of Melbourne. The Prize recognizes Alexandra's outstanding work in the preparation and characterization of light-responsive polyelectric/gold nanoparticle microcapsules for drug delivery. This work is recognized internationally as contributing to some of the most exciting potential applications of nanotechnology, and a key step in the development of new targeted medical treatments.

Read more at www.nanovic.com.au

Demand for Gold in Electronics Up

In this year's annual survey, GOLD 2005, released by consultancy firm GFMS, industrial demand for gold in 2004 was reported to be 411 tonnes, a rise of 8% on the previous year. This was largely driven by increased demand for gold bonding wire in consumer electronics.

The full survey of the gold market can be obtained at www.gfms.co.uk

World Gold Council reports that demand for the first Quarter of 2005 continues to rise overall although there was 6% fall in electronics compared to the same Quarter in 2004 as a result of a slowing in demand from the boom conditions of 2004 and a reduction in stock levels. In contrast, decorative and other industrial uses continued to grow and jewellery demand was up 19% over the same period in 2004. Investment demand also continues to be buoyant.

Funding for US Nanotechnology Start-up

Solaris Nanosciences Corporation has announced that it has closed on an investment made by the Slater Technology Fund, a venture development fund in Providence, RI, USA. Solaris Nanosciences is a new Rhode Island nanotechnology company developing and scaling up its technology to become a leading manufacturer of gold based nanoparticles for use in next-generation products including cost effective solar energy panels, clearer video displays, and vision enhancement.

Solaris Nanosciences is creating high-volume, scalable, synthetic routes for the production of novel gold-based nanomaterial structures for enhanced solar cells and other applications. The company has successfully made core-shell structures for collaborative testing in solar cell applications at the Swiss Federal Institute where dye-sensitized solar cells were discovered and pioneered using conventional materials. In addition, they have also produced a number of nanomaterials for further surface modification and eventual use in vision and liquid crystal display applications.

For more information about Solaris Nanosciences and its technologies, visit www.solarisnano.com

Gold Based Biomedical Test

Stanford chemist Richard Zare and his colleagues have developed a simple test for determining when protein molecules change shape. Every protein is folded into a unique, three-dimensional shape that allows it to function properly. Now Stanford University scientists have developed a simple test that instantly changes colour when a protein molecule attached to a gold nanoparticle folds or unfolds. The new technique, which works on the same principle as ordinary pH tests that measure the acidity of water, is described in the March 2005 issue of the journal *Chemistry and Biology*. The researchers created a solution of gold nanoparticles coated with the protein cytochrome c. Lowering the pH from 10 to 4 caused the cytochrome c molecules to unfold and the particles to aggregate, turning the solution from red to blue.

"We chose gold nanoparticles because they are simple to prepare, easy to control and cost effective," the authors wrote. "To the best of our knowledge, however, gold nanoparticles have not been previously used to investigate the folding and unfolding of proteins." A gold nanoparticle sensor could turn out to be a quick and inexpensive way for doctors to identify antibodies and other signs of infection in the blood stream.

Read more at http://www.sciencedaily.com/releases/2005/03/050326010448.htm

Impressive Results Using Gold in Mercury Control

A US Depart of Energy project based on the pilot testing of mercury oxidation catalysts for control of mercury emitted by coal fired power stations, is revealing impressive results for gold-based catalysts. Oxidised mercury is much easier to

capture than elemental mercury and the field trials are currently evaluating four types of catalysts including gold and palladium. In the published report available on the DOE website, only the gold catalyst showed no tendency for loss of activity in mercury oxidation versus time.

The full report can be downloaded at http://www.netl.doe.gov/coal/E&WR/mercury/control-tech/pubs/GRE-CPSQ123104.pdf

Gold Nanotube Based Membrane as Separation Filters

A team at the University of Florida has published work in the Journal of Nanoscience and Nanotechnology describing a modified electroless plating strategy that can be used to deposit high-quality Au nanotubes within the pores of the alumina templates. Gold nanotube-containing membranes prepared by the template method are said to show promise for use as highly selective filters for membrane-based chemical and biological separations.

For more information see http://www.aspbs.com/jnn/contents_jnn2004.htm

3M Corporation Patent Application on New Gold Catalysts

A new patent application WO2005030382 by 3M Corporation has been published, describing the use of physical vapour deposition methodologies to deposit nanoscale gold on activating support media, preferably carbon, alumina or titania. 3M claim that their new approach makes the use of catalytically active gold dramatically easier and opens the door to significant improvements associated with developing, making and using gold-based catalytic systems.

Nanoparticle Production Facility Makes Gold Available

The University of Missouri-Columbia has announced that it will soon offer a reliable and continuous supply of gold (and silver) nanoparticles to help researchers pursue cutting edge research in nanoscience and nanomedicine. The Nanoparticle Production Core Facility (NPCF) will be a unique resource, enabling access to gold nanoparticles that until now have not been readily available.

For more information see http://www.physorg.com/news3960.html

World Gold Council Announces Support for MRS Symposium

The Materials Research Society is a not-for-profit organisation which brings together scientists, engineers and research managers from industry, government, academia and research laboratories to share findings in the research and development of new materials of technological importance. Founded in 1973, MRS now consists of more than 13,000 members from the United States, as well as over 50 other countries. World Gold Council has announced its support for the 'Nanoparticles and Nanostructures in Sensors and Catalysis' Symposium at the MRS's 2005 Fall meeting. The goal of this symposium is to provide a forum for scientific and technical exchange to advance the research and technology of nanoparticles and nanostructures in sensor and catalysis applications, an area in which gold is becoming increasingly important.

Invited speakers at the symposium include Naomi Halas (Rice University, USA), Masatake Haruta (Inst. of Advanced Ind. Science & Technology, Japan), and Graham Hutchings (Cardiff University, United Kingdom) all of whom have worked extensively with gold in recent years.

For more information see http://www.mrs.org/meetings/fall2005/program/index.html

Gold Used in Hydrogen Generation

In a report to UPI's Nano World, the use of nanotubes in photolysis, as a means of generating hydrogen, has taken on a new dimension. A team at Sandia National Laboratories in Albuquerque has employed nanotubes containing gold (on the inside) and platinum (on the outside), that naturally self-assemble into nanotubes, so that they can work both in the visible and ultraviolet light ranges. It is claimed that these tubes are easy to make, inexpensive and stable after repeated use.

Nanotechnology-assisted solar energy uses sunlight to split water molecules placed on semiconductors into their constituent hydrogen and oxygen. Research has shown that billionth-of-a-meter-scale nanotubes can channel the hydrogen separated from water molecules and keep the atoms apart before they can recombine with oxygen.

See www.sciencedaily.com for more information.