

Welcome to the first issue of a brand new newsletter focused on the use of gold in nanotechnology related applications. This newsletter will be published quarterly in conjunction with the e-journal *Gold Bulletin* and the sister newsletter on catalysis, *CatGold News*.

Why create *NanoGold News*? Well, there is so much happening related to gold nanotechnology that at World Gold Council we thought it would be very useful to summarise the key developments and news on a regular basis and in an accessible format. We hope you like this first issue. If you have news of research papers, international networks, company launches or new products that are concerned with gold-related nanotechnology, please do let us know. Likewise if you are a researcher and have an interesting piece of research or development that you would like to share with your peers, please drop us a line at industry@gold.org

WORLD GOLD COUNCIL



National toxicology program may test gold nanoparticles

A Federal Register notice published on March 29 in the US has listed gold (and silver) nanoparticles amongst a number of new chemicals and materials that the Food and Drug Administration have asked the National Toxicology Program (NTP) to study.

This will seek to determine whether their use causes specific health problems. Comments on whether the NTP should test the gold nanoparticles and, if so, what types of tests are warranted, were due by May 10 2007 for the attention of Dr Scott Masten, email masten@niehs.nih.gov

Producers and users of gold nanoparticles interested in the progress of this initiative should contact Dr Masten directly. ●



French gold: nano group launched

A network specifically focusing on gold-related nanotechnology has been launched in France under the direction of Dr Catherine Louis at UPMC, Paris.

The Groupement de Recherche, entitled GDR Or-nano (for Gold Nanoparticles) has been created by the CNRS to run for 4 years. The first meeting of the network took place on November 27 and 28, 2006 in Paris and a full report can be found in Gold Bulletin 40(1). This meeting gathered around 130 French

researchers (as well as 3 Belgians and 1 Swiss) working on gold nanoparticles in different fields: physics, chemistry and biology. The goal is to establish the state of art on this topic in France and to generate new research collaborations. Further information can be found at www.or-nano.org ●

New start-up focused on gold nano materials

A new start-up company launched by academics from the University of Binghamton in the US can now supply a range of gold-based nanoparticulate materials.

These products include:

- Au nanoparticles (1-20 nm range with high monodispersity)
- AuPt nanoparticles (1-10 nm range)
- AuAg nanoparticles (1-10 nm range)
- Fe-oxide-Au coreshell nanoparticles
- Other mono, bi, and tri metallic alloy nanoparticles (e.g. AuPtFe nanoparticles)
- Carbon-supported Au-based alloy nanoparticle catalysts for fuel cell reactions including Au/C, AuPt/C, AuAg/C

NSC Technology can be contacted for more information; Suite 2108, Innovative Technologies Complex, PO Box 6000, Binghamton, NY 13902, USA. Email: info@NSCTek.com ●



Nanogold used in cosmetic products

Gold nanoparticles are finding use in a wide range of cosmetic and beauty applications.

Companies involved with 'nanogold' based cosmetic products include NanoPlasma Centre's Nanoseal who market a range of face creams containing nanoparticulate gold, see www.nanoplasmacenter.com and SongSing Nano Technology's skin creams <http://www.ssnano.net/index.htm>. Korean nanotechnology company Nano-Vision Tech has recently been assigned with an International Nomenclature Cosmetic Ingredient (INCI) designation for its nano-gold material. The assignment was made by the industry body The Cosmetic, Toiletry and Fragrance Association (CTFA). Nano-Vision Tech are supplying the Nano gold for use in soap, hair tonic and face masks. For more information see www.nanovistech.com ●



NANO PARTS™

Nanoparts™ is a privately held company with offices in Honolulu, HI and Ames, IA whose mission is to develop, manufacture and sell patented technologies in nanoparticles, nanostructures and nanomaterials.

Released in 2006, Nanoparts™ first product line is a patent pending and proprietary method of gold nanoparticle manufacturing that results in a highly monodisperse particle in both size and shape. When compared to the existing citrate stabilized particles used for lateral flow applications in the past, these particles offer reduced surface charge and a significant increase in reactivity. Because of our ability to make exact sizes with each batch having extreme monodispersity, these particles may be purchased in even sizes from 30-90 nm with a size variation of less than 2 nm. These particles are perfect for biomedical applications such as Resonance Light Scattering (RLS), Surface Enhanced Raman Scattering (SERS), as well as Surface Plasmon Resonance (SPR), fluorescence quenching, and x-ray enhancement. Additionally, these particles may be purchased in a "Neutral Gold™" format, where surface conjugations are applied that give the particle a neutral charge

– thereby reducing or eliminating ionic induced binding and thereby non specific binding. This gold significantly improves immunoassays as well as provides the ability for gold labelled DNA.

Recently, Nanoparts™ has exclusively licensed technology that will provide for a complete line of gold nanorods, nanocubes, and other shapes. Nanorods, for instance, may be manufactured for specific absorption characteristics that make them ideal for cancer detection and photothermal therapy. Their tunability range is from the visible to the near-IR wavelengths and have very high absorption cross sections. Currently, preproduction quantities are available for evaluation.

At Nanoparts™ we believe that we aren't just selling 100 ml of 30 nm gold nanoparticles, we are selling 1.3×10^{10} individual nanoparticles – each one specifically manufactured to be that single label detected in your nanotechnology application. ●

Christian Schoen, PhD President, Nanoparts Inc.
www.nanoparticles.com



Conductive gold inks

In the last few years, a good deal of research has been focused on the use of gold nanoparticles in conductive inks.

Such inks, if they are to be applied in the electronics industry need to offer good electrical conductivity at the lowest possible processing temperature.

NanoMas Technologies Inc from New York State, USA now offer a commercial gold ink that can be processed between 150-200°C achieving a resistivity 4x that of bulk gold. They can tune surface chemistry for different solvent dispersions and applications.

For more information see
<http://www.nanomastech.com/docs/Ink-Gold.pdf> ●

Gold nanoparticles used as lubricant

The lubricating properties of gold are being exploited in an unlikely commercial application in China. The NanoGold Oil™ from Jie Yuan Nano Tech Co. Ltd is an additive for petrol or diesel engines that is claimed to offer fuel savings and power improvements, as well as reduced engine noise. Traditionally graphite can be used as an ingredient of cylinder coating additive, along with polytetrafluoroethylene (i.e. Teflon). The manufacturers claim that in fact gold is the best material for a cylinder coating additive but is rarely used due to its high price and limitations of milling technology. NanoGold Oil™ is based on a liquid additive comprised of synthetic oil and gold and titanium nanoparticles that are believed coat a layer of gold on the engine's cylinder and piston surface, as well as on lower parts of engines such as shaft and cam shaft, thereby filling and sealing micropores and pits that may exist. For more information see
<http://www.nano95.com.tw/eng.htm> ●