NASA Goddard Space Flight Center announces that its method for manufacturing high-quality carbon nanotubes has been named a winner in the third annual *Nanotech Briefs* Nano 50 awards in the Technology category. The key innovation in the process is its ability to produce carbon nanotubes without the need for metal catalysts.
www.nasa.gov

QuantumSphere's "Method and Apparatus for Forming Nanoparticles," or QSI-Nano GPC process, allows for volume production of highly active catalyst materials that improve electrode performance in batteries, fuel cells, and on-board production of hydrogen through electrolysis. The automated, scalable, and environmentally safe process is the first to make ultrapure, highly uniform and narrow size distribution particles without the use or production of hazardous chemicals or gasses.
www.qsinano.com

Science Applications International Corp. has won a follow-on contract from the Naval Research Laboratory's Center for Corrosion Science and Engineering to support its program on research, development, test, and engineering of corrosion mechanisms on various systems and materials.
www.saic.com

Nanowire-based photovoltaics build small powerful solar cells

A nanowire made of three different kinds of silicon with different electrical properties has reportedly been developed by researchers at Harvard University, Cambridge, Mass. The silicon is wrapped in layers to fabricate the wire. When light falls on the outer material, a process begins due to the interaction of the core with the shell layers, leading to the generation of electrical charges. These layers absorb light and capture electrons to produce electricity. Solar cells made from a single nanowire just 300 nanometers wide could be useful for powering tiny sensors or robots for environmental monitoring or military applications. Moreover, the basic design of the solar cells could be useful in large-scale power production, potentially lowering the cost of generating solar power.

To make the cells, Prof. Charles Lieber modified methods previously used to make nanowires that could serve as sensors or transistors. He then demonstrated that his solar cells can power two of his earlier nanowire devices, a pH sensor, and a set of transistors.

For more information: Charles Lieber, Harvard University, 12 Oxford Street, Cambridge, MA 02138; tel: 617/496-3169; cml@cmliris.harvard.edu; www.harvard.edu; http://harvardscience.harvard.edu/node/7623.

SCM Metal Products, Research Triangle Park, N.C., has formed a joint venture company, Cupron Advanced Materials LLC, with Cupron Inc., Greensboro, N.C., to make raw materials for copper antimicrobial products in healthcare, medical, military, and apparel applications. Production of pigmented and non-pigmented pellets made from SCM's cuprous oxide will begin during the first quarter of 2008.
www.scmmetals.com.

Polymer-base piezoelectric composites function at high heat

Amorphous polymers said to be capable of maintaining piezoelectric properties at temperatures higher than 90°C (194°F) are under development at Gaiker-IK4 Technology Center, Spain. These materials are designed for service conditions of extreme temperature where semi-crystalline polymers cannot function. To this end, and after prior work with different materials, polyimides were selected as the matrix material because of their excellent thermal, mechanical, and dielectric properties. Various dipolar groups (-CN, $-SO_2-$, $-CF_3$) have been incorporated into the molecule, varying the number and position of these groups to fix their physical and piezoelectric properties. Moreover, it has been shown that the value for the temperature of vitreous transition is fundamental for these polyimides, as this determines the temperature at which piezoelectric properties are lost. Specifically, these polymers show piezoelectric stability up to temperatures of 150°C (300°F), and do not begin to degrade until above 400°C (750°F).

The only piezoelectric polymer that currently exists on the market is polyvinylidene difluoride (PVDF). This semi-crystalline polymer is characterized by having very good piezoelectric properties, but only to 90°C (194°F).

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Carbon nanotubes build better protective body armor

The elasticity of carbon nanotubes can enable development of protective body armor that not only stops bullets, but also can prevent blunt force trauma, report engineers from the Centre for Advanced Materials Technology at the University of Sydney, Australia.

The elasticity of carbon nanotubes means that blunt force trauma may be avoided, and is the reason that engineers in Sydney have undertaken experiments to find the optimum point of elasticity for the most effective "bullet-bouncing" gear.

"By investigating the force-repelling properties of carbon nanotubes and deciding on an optimum design, we may produce far more effective bulletproof materials," say Prof. Liangchi Zhang and Dr. Kausala Mylvaganam. "The dynamic properties of the materials we have found means that a bullet can be repelled with minimum or no damage to the wearer of a bullet proof vest."

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