Au NPs measured along the long-DNA is ~21 nm, which is consistent with the length of the 63-nucleotide circular DNA template and the distance between base pairs in the B form of dsDNA (0.34 nm). This data, as well as AFM studies, strongly suggested to the researchers that the nanoassembly was well defined and periodic. The researchers said that the drawbacks of their system, including polydispersity associated with RCA, are far outweighed by the advantages: the periodicity in 3D is well defined; the distance between the assembled nanospecies can be readily controlled; the assembly is entirely reversible; and multiple assemblies, wherein two or more nanospecies can be simultaneously constructed, can be easily realized.

Steven Trohalaki

Mixed Hydride Material Offers Hydrogen Storage Solutions

The major roadblock to moving toward a hydrogen economy involves issues with the storage of hydrogen, especially on vehicles. Despite promising strides made in the development of hydrogen storage materials, new and more complex materials systems still need to be developed to adequately resolve the challenges associated with storing hydrogen. In the May issue of *Chemical Communications* (DOI: 10.1039/b518243c), a team of researchers led by P.A. Anderson from the University of Birmingham (UK), W.I.F. David from the Rutherford Appleton Laboratory (Didcot, UK), and P.P. Edwards from the University of Oxford (UK), have reported the synthesis and structure of a complex hydride formed by combining two potential hydrogen storage materials, $LiNH_2$ and $LiBH_4$.

The novel mixed hydride material has a nominal composition of $Li_4BN_3H_{10}$, but accommodates a wide range of stoichiometries. The researchers were able to use infrared spectroscopy to determine that the BH_4– and NH_2– ions remain intact in their material, demonstrating, they said, that the structure is best regarded as $Li_4BH_4(NH_2)_3$. The structure was determined from powder diffraction data using high-intensity x-rays generated by a synchrotron and from neutron powder diffraction experiments. The B–H bonds in the solid solution appear to be stronger relative to the $LiBH_4$ starting material, but one of the B–H bonds is significantly shorter than the other three. In contrast, the N–H bonds seem to be weaker than in $LiNH_2$, as reported by the research team.

Most remarkably, the researchers said, this mixed borohydride amide, with a structure similar to $LiNH_2$, shows a different decomposition behavior, almost exclusively evolving hydrogen instead of ammonia. The researchers said that this behavior may originate from the molecular proximity of positively charged hydrogen atoms in NH_2 and negatively charged hydrogen in the BH_4- anions. Anderson said, "The ability to modify chemically the decomposition pathway of hydrogen-containing compounds could lead to a whole range of completely new hydrogen storage candidates."

Sarbajit Banerjee

Magneto-Optical Surface Plasmon Resonance Sensor Enhances Detection of Biomolecules

Surface plasmons are collective excitations of electrons at the interface between a conductor and a dielectric material. Surface plasmon resonance (SPR) is a strong function of the refractive index of the insulator. Conventional SPR-based biosensors are able to resolve differences in refractive index of $\sim10^{-5}$, which corresponds to a detection sensitivity of 1–5 pg/mm^2 of biomolecules adsorbed at the sensor surface. For direct detection of small molecules, resolutions approaching 0.1 pg/mm^2 or lower are required. In the April 15 issue of *Optics Letters* (p. 1085), B.

Sepulveda, A. Calle, L.M. Lechuga, and G. Armelles from the Instituto de Microelectronica de Madrid have reported an SPR sensor in which the magneto-optical activity of magnetic materials is used along with conventional SPR for enhanced sensitivity.

Gold (23 nm)/chromium (3 nm)/cobalt (7.5 nm)/chromium (2 nm) layers were deposited by electron-beam evaporation onto glass substrates. Cobalt served as the ferromagnetic layer and gold is commonly used in plasmonic applications. The chromium layers were added to enhance adhesion of the Au/Co structure. To study the angular dependence of the reflectivity, the sensor was mounted on a rotation stage and *p*-polarized light from a He-Ne laser was used to excite SPR. The reflected light was collected by a photodiode. A flow cell and peristaltic pump were used to control the various solutions. The performance of the novel magneto-optic SPR (MOSPR) sensor was compared with a conventional SPR sensor consisting of Au (45 nm)/Cr (2 nm) layers that were also deposited on glass substrates.

The researchers evaluated the sensitivities of the two biosensors by flowing solutions of different refractive indices and measuring the reflectivity at a fixed angle of incidence. Comparison of the two measurements revealed that the experimental sensitivity of the MOSPR sensor is about three times that of the conventional one. The researchers then tested the response of the MOSPR device for the adsorption of a 10 μg/ml solution of bovine serum albumin proteins in a phosphate buffer saline. According to Sepulveda and co-workers, the MOSPR sensor again showed a threefold increase in signal intensity compared with the SPR sensor. The researchers said that an improvement in sensitivity of an additional order of magnitude is feasible by further optimization of the metallic layers.

JEREMIAH T. ABIADE

Research Opportunities

Global School for Advanced Studies
http://gsasprogram.org

The Global School for Advanced Studies (GSAS), a new joint initiative of the Materials World Network and the Global Nanotechnology Network, is featuring an inaugural session on advanced solar cell research. GSAS seeks applications from advanced doctoral candidates, postdoctoral fellows, or junior researchers from relevant science and engineering disciplines. Direct experience in solar cell research is not a condition for admission, as GSAS scholars will be assigned to global research teams with complementary research expertise. The teams will meet in Taiwan September 19–29, 2006, for lectures, expert mentoring, and project development. The global research team with the best project will be awarded a one-year team research fellowship in Taiwan. This inaugural session is jointly sponsored by Taiwan's National Science Council and the U.S. National Science Foundation. For more information, access Web site http://gsasprogram.org. □

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www.mrs.org/connections

Correction

In the March 2006 issue of *MRS Bulletin* **31** (3) p. 218, k_B in Equation 1 should have been k_B^2.