chased PS beads were functionalized with a submonolayer of 10–20-nm-diameter silver nanoparticles using a commercially available electroless silver-deposition kit. The beads were poured into a cell consisting of two glass substrates spaced 10–70 μm apart. Titanium (IV) isopropoxide in isopropanol was then added to the cell, and the assembly was exposed to air to hydrolyze the titanium isopropoxide to amorphous titania. The PS beads were then dissolved in toluene, and the remaining hollow titania shells were released from the glass substrate by sonication.

The researchers demonstrated the versatility of this method for the titania shell/silver-nanocrystal system by preparing hollow shells with void sizes of 0.38 μm and 1 μm by using PS beads with different diameters. The shell thickness was also varied from 30 nm to 170 nm by increasing the concentration of the isopropoxide precursor. The void sizes and shell thicknesses of the hollow spheres were confirmed by transmission and scanning electron microscopy. These micrographs also showed that the silver nanocrystals were securely embedded in the walls of the spheres. The spheres were found to be robust enough to maintain their shape throughout the templating and post-treatment processes.

The researchers believe that this synthetic method can be extended to prepare functionalized hollow spheres having a large variety of core materials and inner surface microstructures. Also, hollow spheres with voids in the walls could be prepared by removing the functionalities through wet etching or calcination. The researchers said that a particularly exciting application involves decorating the inner surface with a catalyst and using the wall of the hollow sphere to control the diffusion of substrate and product species of the catalytic process.

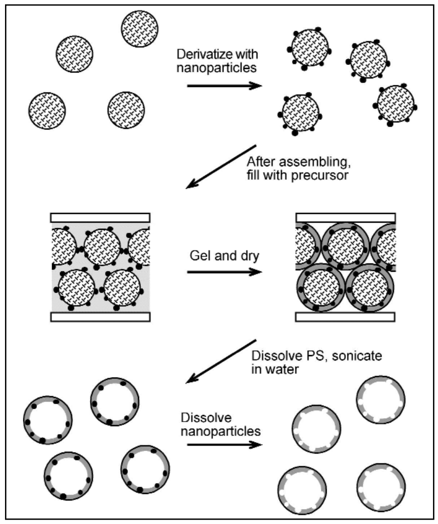

Figure. Schematic outline of the experimental procedure: The polymer template could be either dissolved with a solvent or burnt out through calcination at elevated temperatures. Reproduced with permission from Chem. Mater. ***13*** *(2001) p. 1146. Copyright 2001 American Chemical Society.*

GREG KHITROV

Electromagnetically Induced Transparency Observed in Raman Studies of Nitrogen-Vacancy Color Centers in Diamond

Diamond has been found to have potential for use in electromagnetically induced transparency (EIT) applications. In the March 15th issue of *Optics Letters*, experimental results were presented by researchers from the Hanscom Air Force Research Laboratory, Massachusetts Institute of Technology, and Texas A&M University, showing Raman-excited spin coherences in the nitrogen-vacancy (N-V) color center in diamond. This material was chosen because of its large optical oscillator strength (~0.1), its relatively long spin-coherence lifetimes (1–100 μs range), and its previous exhibition of Raman heterodyne signals. The diamond sample had ~30 parts in 10^6 N-V color centers.

A magnetic field was applied in the (111) orientation of the N-V centers as laser beams at different frequencies were focused into the crystal. The beams originated from one dye laser output that had been shifted with the use of acousto-optic frequency shifters. A nondegenerate four-wave mixing (NDFWM) signal was generated and analyzed as a function of Raman laser-beam intensities in order to determine the saturation curve. The linewidth was then measured at intensities well below the saturation limit. The ~5.5 MHz linewidth indicated that the signal was due to the Raman process.

By reducing the intensity of one beam and using it as a probe, and increasing the intensity of another beam to its maximum intensity and using it as a coupling beam, EIT was observed in the sample. The NDFWM beam was blocked during this experiment. A maximum transparency of 17% was reached, which corresponds to about 70% of what is possible, considering that only one out of four N-V centers are oriented in the (111) direction. A fit to the EIT spectrum gives a Rabi frequency of ~160 MHz.

ERIN CARTER

News of MRS Members/Materials Researchers

Zdeněk P. Bažant, Walter P. Murphy Professor of Civil Engineering and Materials Science at Northwestern University, has been awarded the **honorary degree Doctor of Science h.c. from the University of Colorado—Boulder** for his substantial contributions to structural engineering and solid mechanics worldwide.

Angela M. Belcher, assistant professor in the Department of Chemistry and Biochemistry at the University of Texas—Austin, has received a **2000 Presidential Early Career Award for Scientists and Engineers,** recognizing her pioneering research in combining organic and inorganic substances to produce new materials.

Clifton Draper has accepted a position on the executive team at Sensors Unlimited Inc., in Princeton, New Jersey, where, as liaison between manufacturing and research and development, he will provide key product analysis and assessment, advancing the quantity and variety of fiber optic components that Sensors can deliver to the marketplace. Draper will be retiring from Lucent Technologies, bringing to his new position 23 years of experience in optical-fiber and semiconductor device manufacturing research, as well as fundamental research in the field of laser interactions with materials.

Mary Lowe Good, Founding Dean of the College of Information Science and Systems Engineering at the University of Arkansas at Little Rock and President of the American Association for the Advancement of Science, has been awarded the **2001 J. Herbert Hollomon Award of *Acta Materialia*** in recognition of her outstanding contributions to understanding relations between materials technology and society, and/or contributions to materials technology that have had a major impact on society. The award will be presented at the Fall Meeting of The Minerals, Metals & Materials Society during the ASM International Awards dinner on November 6.

John B. Goodenough, professor of engineering at the University of Texas—Austin, has received the **Japan Prize from the Science and Technology Foundation of Japan** in the category of "Science and Technology of Environment Conscious Materials" for his discovery of lithium manganese oxide, lithium cobalt oxide, and lithium iron phosphates that have been critical to the development of lightweight and high-energy-density rechargeable batteries. Goodenough was honored during a prize ceremony in Tokyo in April.

Ru-Ling Meng, a researcher with the