sity and Argonide Corporation (Sanford, Fla.), led by Thomas J. Webster of the Department of Biomedical Engineering at Purdue, found that osteoblast function and consequently bone formation on the implant depend strongly on the topology of the implant's surface and the morphology of crystallites. They said that the shape and size of the nanophase implant particles are consistent with the dimensions of hydroxyapatite particles of natural bone. In general, the researchers identify three factors that promote enhanced osteoblast response: chemical composition, crystalline phase, and topography.

As reported on November 5 in the online edition of the *Journal of Biomedical Materials Research Part A* (to appear in print in the December 15 issue), Webster, Rachel L. Price at Purdue, and their colleagues analyzed the osteoblast function depending on the degree of nanometer surface roughness of alumina substrates. The alumina-based materials were chosen for their high osteoblast activity as compared with titanium and etched glass. The researchers used conventional spherical (α-Al_2O_3 spheres, 167 nm), nanophase spherical (δ-Al_2O_3 spheres, 23 nm), and nanofiber (boehmite fibers 2–4 nm diameter by more than 50 nm long) alumina compounds.

The researchers found that cell adhesion and proliferation results are statistically greater on nanofiber alumina as compared with other compounds. More important, calcium deposition by bone cells significantly increases on both nanoparticulate alumina substrates. They analyzed the influence of the three factors on osteoblast function. The study of the first factor shows that proteins absorb differently on materials with dissimilar chemical composition; the study of the second factor, that the transition alumina (δ- and boehmite phases) may promote an increased cell response compared to the more crystalline alumina phase (α); and the study of the third factor, that a decrease in the grain size to nanometer dimensions translates to an increase in osteoblast function. The researchers demonstrated that nanofiber alumina may offer the potential to ensure sufficient bone ingrowth and therefore to make orthopedic implants more stable.

The researchers concluded that "with knowledge of the influence that chemistry, phase, size, and nanoparticle aspect ratio have on osteoblast function, an ideal material for orthopedic/dental applications may be designed."

EKATERINA A. LITVINOVA

Ferromagnetic Ordering of Pure Organic Compound Occurs Below 1.6 K

Contrary to Heisenberg's proposition that bulk ferromagnetic ordering could only appear in systems with heavy atoms, recent synthesis and characterization of several organic ferromagnets has been reported. Such systems are mainly based on sulfur- or nitrogen-containing organic radicals. A group of researchers from Cambridge University, in cooperation with scientists from CSIC–Universidad de Zaragoza (Spain), CNRS (France), Bunkyo-ku, Japan, and the University of Cardiff (United Kingdom) has discovered a thiazyl-based neutral organic compound that undergoes ferromagnetic ordering below 1.6 K.

As reported in the November 3 issue of *Angewandte Chemie*, Jeremy M. Rawson of Cambridge and colleagues have synthesized and described magnetic properties of the thiazyl-based radical, p-$O_2NC_6F_4CNSSN^{\bullet}$. The radical was obtained by consequent reaction of p-$O_2NC_6F_4CN$ with $Li[N(SiMe_3)_2]$ and SCl_2 in Et_2O solution.

Upon determination of the crystal structure of the radical, the researchers were able to explain the ferromagnetic behavior of the substance. They described the crystal structure as chains of molecules linked through electrostatic $S^{\delta+}\cdots O^{\delta-}$ interactions in the (110) plane with the planes related by means of a 4_1 screw axis along the c-axis. In this case, the molecules form four symmetry-equivalent intermolecular S···N contacts 3.681 Å in length.

The researchers provided detailed magnetic measurements at low temperatures and showed that the compound exhibits Curie–Weiss behavior down to 10 K, while at the temperatures below 1.6 K, it begins to order ferromagnetically. Furthermore, the research team observed magnetic anisotropy in magnetization values along and perpendicular to the [001] axis of a single crystal. Based on crystal structure and previous studies of ferromagnetic properties of analogue thiazyl molecular magnets, the research team concluded that ferromagnetic interactions in the compound are referred to the nearly orthogonal nature of the singly occupied molecular orbitals on neighboring molecules.

ANDREI A. ELISEEV

News of MRS Members/Materials Researchers

Annelise Barron, of the Materials Research Center in Northwestern University, Illinois, was promoted to associate professor with tenure this fall.

Jean Blachère, associate professor emeritus at the University of Pittsburgh, has received the **Albert Victor Bleininger Memorial Award** from the Pittsburgh section of the American Ceramic Society in recognition of his leadership in the ceramics field.

Lynn Boatner of Oak Ridge National Laboratory received the **2003 American Association for Crystal Growth Award** in recognition of his "novel research in the area of crystal growth that has advanced the application of single-crystalline materials and enhanced the appreciation of crystals both scientifically and aesthetically."

Gail J. Brown, principal research physicist in the U.S. Air Force Research Laboratory at Wright-Patterson Air Force Base in Ohio, has received the **Air Force Basic Research Award** for cutting-edge research on superlattice materials for next-generation infrared sensing. The award also recognizes Brown for exemplary leadership in coordinating the research project from computational modeling and growth of the superlattice materials to initial device testing of the new materials' system.

James Wai-Jeung Chan of the Chemical Engineering and Materials Science Department at the University of California, Davis, received the **2003 Zuhair A. Munir Award for Best Doctoral Dissertation** from the UC—Davis College of Engineering for his research on "Confocal Laser Spectroscopy of Glasses Modified by Ultrashort Laser Pulses for Waveguide Fabrication" under the mentorship of Subhash Risbud.

Bai Chunli, vice president of the Chinese Academy of Sciences, has been elected vice president of the Asia Pacific Academy of Materials, a nongovernmental institution aimed at promoting free exchanges of research and development in the field of materials research through international cooperation.

Thomas F. George has been appointed chancellor of the University of Missouri—St. Louis, effective September 1, 2003. Before coming to UM—St. Louis, George

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