

April 2005

AMERICAN CERAMIC SOCIETY BULLETIN

www.ceramicbulletin.org \$7.50



TECHNOLOGY BRIEFS

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New Spin on Electrospinning

The technique of electrospinning uses external electrical forces which have been used extensively to produce polymeric fibers with diameters in the range of 3–1000 nm, depending on the strength of the applied voltage between a drop of the precursor solution (or melt) and the collecting surface.

The possibility of extending the concept to ceramic systems has opened a new era in nanoscale research over the past couple of years. It is possible to synthesize these one-dimensional nanofibers in pure form, or as suitable ceramic-polymer composites.

Researchers in the Dept. of Chemical & Environmental Engineering at the University of Toledo (Ohio) have successfully accomplished the fabrication of two key ceramic components of great relevance in fuel cells and catalysis, namely, 8 mol% yttria-stabilized zirconia (8YSZ) and 10 mol% gadolinia-doped ceria (10GDC) in nanofibrillar structures.

The target compositions were first electrospun in the form of polymer-ceramic composite fibers, which were subsequently processed to yield ceramics of the desired composition. (Contact: A.-M. Azad, E-mail abdul-majeed.azad@utoledo.edu)