

Recent Journal Articles on Current Research

Professor Martha Mecartney

University of California, Irvine
Department of Chemical Engineering and Materials Science
Irvine, CA 92697-2575
e-mail: martham@uci.edu telephone: 949-824-2919

I. Superplastic Ceramics for Net Shape Manufacturing – *Funding from National Science Foundation (NSF) Division of Materials Research (DMR) Grant 0207197 and NSF DMR Grant 0606063. The opinions and interpretations expressed in these articles are those of the authors only, and not of NSF.*

A. Superplastic **Multiphase and Nanocrystalline** Ceramics

Title: [Creep characteristics of alumina, nickel aluminate spinel, zirconia composites](#)

Author(s): [Dillon RP](#) (Dillon, R. Peter)¹, [Kim DK](#) (Kim, Dong-Kyu)², [Trujillo JE](#) (Trujillo, Joy E.)¹, [Kriven WM](#) (Kriven, Waltraud M.), [Mecartney ML](#) (Mecartney, Martha L.)¹

Source: **JOURNAL OF MATERIALS RESEARCH** Volume: **23** Issue: **2** Pages: **556-564** Published: **2008**

Title: [Phase stability, microstructural evolution and room temperature mechanical properties of TiO₂ doped 8 mol% Y₂O₃ stabilized ZrO₂ \(8Y-CSZ\)](#)

Author(s): [Chen T](#) (Chen, Tiandan)², [Tekeli S](#) (Tekeli, Suleyman)¹, [Dillon RP](#) (Dillon, Robert P.)², [Mecartney ML](#) (Mecartney, Martha L.)²

Source: **CERAMICS INTERNATIONAL** Volume: **34** Issue: **2** Pages: **365-370**
Published: **2008**

Title: [High-temperature deformation behaviour of TiO₂-doped 2 mol.% Y₂O₃-stabilized ZrO₂ \(8Y-CSZ\) under tension and compression](#)

Author(s): [Tekeli S](#) (Tekeli, Suleyman), [Chen TD](#) (Chen, Tiandan), [Nagayama H](#) (Nagayama, Hitoshi), [Sakuma T](#) (Sakuma, Taketo), [Mecartney ML](#) (Mecartney, Martha L.)

Source: **CERAMICS INTERNATIONAL** Volume: **33** Issue: **5** Pages: **869-874**
Published: **2007**

Title: [Dynamic formation of zircon during high temperature deformation of zirconia-silica composites with alumina additions](#)

Author(s): [Dillon RP](#), [Mecartney ML](#)

Source: **JOURNAL OF MATERIALS SCIENCE** Volume: **42** Issue: **10** Pages: **3537-3543** Published: **2007**

Title: [Superplastic compression, microstructural analysis and mechanical properties of a fine grain three-phase alumina-zirconia-mullite ceramic composite](#)

Author(s): [Chen TD](#), [Mecartney ML](#)

Source: **MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING** Volume: **410** Issue: **Sp. Iss. SI** Pages: **134-139** Published: **2005**

Title: [Comparison of the high-temperature deformation of alumina-zirconia and alumina-zirconia-mullite composites](#)

Author(s): [Chen TD](#), [Mecartney ML](#)

Source: **JOURNAL OF MATERIALS RESEARCH** Volume: **20** Issue: **1** Pages: **13-17**
Published: **2005**

Title: [A high-strain-rate alumina-based ceramic composite](#)

Author(s): Chen T, [Mecartney ML](#)

Source: **JOURNAL OF THE AMERICAN CERAMIC SOCIETY** Volume: **88** Issue: **4**
Pages: **1004-1006** Published: **2005**

Title: [Achieving tensile superplasticity in 8 mol% Y₂O₃ cubic stabilized ZrO₂ through the addition of intergranular silica](#)

Author(s): Dillon RP, Sosa SS, [Mecartney ML](#)

Source: **SCRIPTA MATERIALIA** Volume: **50** Issue: **12** Pages: **1441-1444** Published:
JUN 2004

Title: [Superplasticity in cubic yttria stabilized zirconia with 10 wt.% alumina](#)

Author(s): Sharif AA, [Mecartney ML](#)

Source: **JOURNAL OF THE EUROPEAN CERAMIC SOCIETY** Volume: **24** Issue: **7**
Pages: **2041-2047** Published: **2004** (*Funded by Los Alamos National Lab/UC Collaborative Research Program*)

Title: [Superplasticity in cubic yttria-stabilized zirconia with intergranular silica](#)

Author(s): Sharif AA, [Mecartney ML](#)

Source: **ACTA MATERIALIA** Volume: **51** Issue: **6** Pages: **1633-1639** Published: **2003**
(*Funded by Los Alamos National Lab/UC Collaborative Research Program*)

B. Deformation of **Mullite** and the Role of Crystallographic Defects in Ceramic Superplasticity

Title: [Observation of dislocation assisted high temperature deformation in mullite and mullite composites](#)

Author(s): [Taherabadi L](#) (Taherabadi, Lili), [Trujillo JE](#) (Trujillo, Joy E.), [Chen T](#) (Chen, Tiandan), [Porter JR](#) (Porter, John R.), [Mecartney ML](#) (Mecartney, Martha L.)

Source: **JOURNAL OF THE EUROPEAN CERAMIC SOCIETY** Volume: **28**
Issue: **2** Pages: **371-376** Published: **2008**

Title: [Threshold stress superplastic behavior and dislocation activity in a three-phase alumina-zirconia-mullite composite](#)

Author(s): Chen T, Mohamed FA, [Mecartney ML](#)

Source: **ACTA MATERIALIA** Volume: **54** Issue: **17** Pages: **4415-4426** Published:
2006

C. Superplastic Forming and the Effect of Grain Boundaries in **Fuel Cell Electrolytes**

Title: [Grain boundary ionic conductivity of yttrium stabilized zirconia as a function of silica content and grain size](#)

Author(s): Martin MC, [Mecartney ML](#)

Source: **SOLID STATE IONICS** Volume: **161** Issue: **1-2** Pages: **67-79** Published:
JUL 2003

II. Nanoparticle Metrology by Atomic Force Microscopy (AFM) – Navy (Naval Surface Warfare Center (NSWS), Corona Division) and Pacific Nanotechnology

Title: [Optimal Sample Preparation for Nanoparticle Metrology \(Statistical Size Measurements\) Using Atomic Force Microscopy \(AFM\)](#)

Author(s): Christopher M. Hoo, Natasha Starostin, Paul E. West, Martha L. Mecartney
Source: **JOURNAL OF NANOPARTICLE RESEARCH**, accepted for publication 2008.

Title: [A comparison of atomic force microscopy \(AFM\) and dynamic light scattering \(DLS\) methods to characterize nanoparticle size distributions](#)

Author(s): [Hoo CM](#) (Hoo, Christopher M.)¹, [Starostin N](#) (Starostin, Natasha)², [West P](#) (West, Paul)², [Mecartney ML](#) (Mecartney, Martha L.)¹

Source: **JOURNAL OF NANOPARTICLE RESEARCH** Volume: **10** Pages: **89-96**
Published: **2008**

Title: [AFM capabilities in characterization of particles and surfaces: From angstroms to microns](#)

Author(s): [Starostina N](#) (Starostina, N.)¹, [Brodsky M](#) (Brodsky, M.)², [Prihodko S](#) (Prihodko, S.)³, [Hoo CM](#) (Hoo, C. M.)⁴, [Mecartney ML](#) (Mecartney, M. L.)⁴, [West P](#) (West, P.)¹

Source: **JOURNAL OF COSMETIC SCIENCE** Volume: **59** Issue: **3** Pages: **225-232** Published: **2008**

Title: [Tip dilation and AFM capabilities in the characterization of nanoparticles](#)

Author(s): [Wong C](#) (Wong, Ch.), [West PE](#) (West, P. E.), [Olson KS](#) (Olson, K. S.), [Mecartney ML](#) (Mecartney, M. L.), [Starostina N](#) (Starostina, N.)

Source: **JOM** Volume: **59** Issue: **1** Pages: **12-16** Published: **2007**

III. Nuclear Waste Ceramics – UC Irvine Seed Research Grant

Title: Synthesis of monoclinic monazite, LaPO₄, by direct precipitation

Author(s): Michael T. Schatzmann, Martha L. Mecartney and Peter E. D. Morgan
Source: **Journal of Materials Chemistry**, in press, (2009).

IV. Pulsed Chemical Vapor Deposition – Collaboration with S. Krumdieck, U. Canterbury, New Zealand

Title: [Nanocrystalline ZrO₂ thin films on silicon fabricated by pulsed-pressure metalorganic chemical vapor deposition \(PP-MOCVD\)](#)

Author(s): Ramirez L, [Mecartney ML](#), Krumdieck SP

Source: **JOURNAL OF MATERIALS RESEARCH** Volume: **23** Issue: **8** Pages: **2202-2211** Published: **2008**