



Exponent[®]
Engineering & Scientific Consulting

Evan Brown, Ph.D., P.E.

Principal Engineer | Materials and Corrosion Engineering
Menlo Park
+1-650-688-7027 | ebrown@exponent.com

Professional Profile

Dr. Brown's general areas of expertise include failure analysis, materials fracture, materials science and processing including nano-/micro- scale fabrication for both room and high temperature applications, electrochemistry, and materials characterization methods with an emphasis on nano-/micro- scale techniques. He specializes in a variety of materials-related issues in the area of consumer electronics, including display failure analyses, characterization and failure analysis of thin films, contamination analyses, and tin whisker-induced failures.

In addition, Dr. Brown is experienced with the formation of anodized aluminum and failure analysis of a wide range of its associated issues. As part of fracture analysis in brittle materials, such as glass and both single-crystal and polycrystalline ceramics, Dr. Brown routinely performs analyses of stress-at-failure, fracture origin identification, and assessment of the cause of fracture.

Prior to joining Exponent, Dr. Brown was a Graduate Research Assistant in the Solid Ionics and Electroceramics group at Caltech, where he received his doctoral degree in 2011. His thesis work revolved around the synthesis and testing of various electrode and electrolyte structures for use in Solid Oxide Fuel Cells (SOFCs). This included the fabrication of ceramic thin films, nanowires, and inverse opals, as well as metallic thin films and two-dimensional anti-dot networks. He is familiar with a wide range of thermal and chemical stability issues associated with fuel cell systems. Often to those ends, he has utilized techniques such as SEM, TEM, AFM, Raman spectroscopy, and XRD to describe functional SOFC materials and their associated microstructures.

Additionally, Dr. Brown has worked at the Nanoscale Materials and Electronics group at UC Irvine developing anodic alumina as a template for controlled ZnO nanowire growth. He has also been a teaching assistant for the Caltech course entitled "Solid State Electrochemistry for Energy Storage and Conversion."

Academic Credentials & Professional Honors

Ph.D., Materials Science, California Institute of Technology (Caltech), 2011

M.S., Materials Science, California Institute of Technology (Caltech), 2008

B.S., Materials Science, University of California, Irvine, 2006

Chancellor's Award for Excellence in Undergraduate Research, UC Irvine, 2006

The Henry Samueli School of Engineering Undergraduate Research Fellowship, UC Irvine, 2005

Integrated Micro/Nano Summer Undergraduate Research Experience Fellowship, UC Irvine, 2005

Prior Experience

Teaching Assistant, Caltech, 2009

Publications

Brown EC, Wilke SK, Boyd DA, Goodwin DG, Haile SM. Polymer sphere lithography for solid oxide fuel cells: A route to functional, well-defined electrode structures. *Journal of Materials Chemistry* 2010; 20:2190-2196.

Fan Z, Dutta D, Chien C, Chen H, Brown EC, Chang P, Lu JG. Electrical and photoconductive properties of vertical ZnO nanowires in high density arrays. *Applied Physics Letters* 2006; 89:213110.

Presentations

Brown EC, Chueh W, Hao Y, Haile SM. Hierarchical ceria electrode structures for solid oxide fuel cells via electrochemical deposition. *Electrochemical Society 218th Meeting*, Las Vegas, NV, 2010.

Brown EC. Fuel cells for a sustainable energy future: Is there a role for nano-materials? *Japan Science and Technology Agency Surveillance Project at California Institute of Technology*, 2009.