In-situ chemical-mechanical-electrical-catalytic measurements of ceramic thin films, coatings, materials & nano-composites

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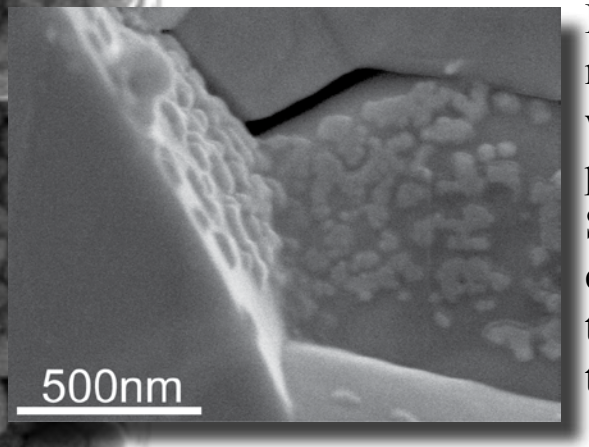
Objective: Development of sub-550°C Solid Oxide Fuel Cell nano-composite fuel cells



Results: A SIMPLE model was developed which predicts the performance of all SOFC nano-composite cathodes ever produced, to within 60% at all temperatures.

Objective: Understanding why constrained sintered films do not obey sintering theory

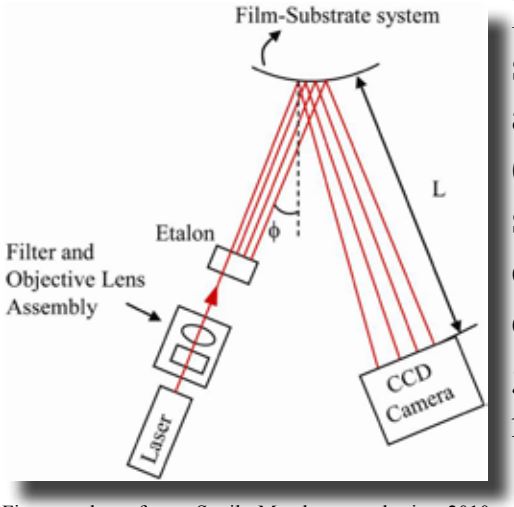
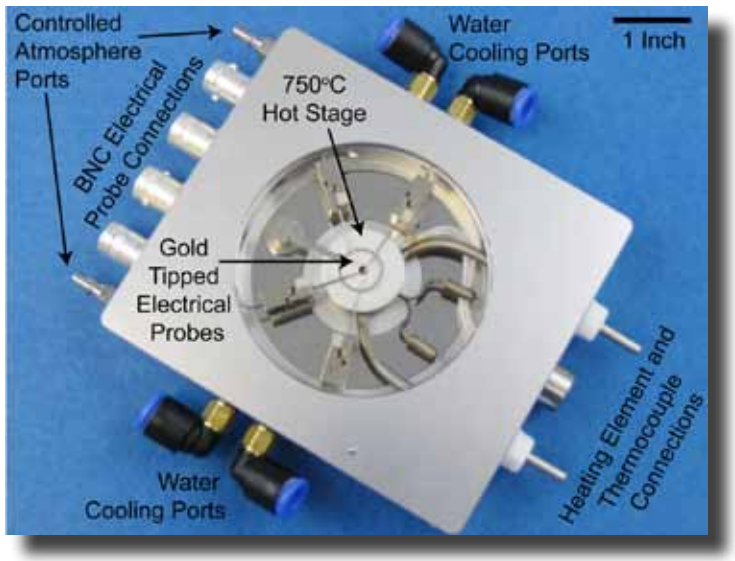


Figure taken from Sunil Mandowara thesis, 2010

Results: In situ sintering stress analysis reveals anomalously large (>160 MPa at 550°C) sintering stresses in constrained sintered ceria, sugesting a novel grain-boundary zipping mechanism is active.

Objective: Characterization of Strain Engineered Materials

Results: In-situ, controlled atmosphere, high temperature, piezoelectric testing station for simultaneous Raman, Impedance Spectroscopy, DC Resistivity, Electrical Conductivity Relaxation, Gas Chromatography, Optical Profilometry, and Bilayer Curvature (Film Strain) Measurements



Need to characterize the defect-controlled (electro-chemical, catalytic, sintering, etc.) properties of your material in extreme conditions? Need cost-effective methods to build nano-composite architectures? We can help!