

Education

Georgia Institute of Technology, Atlanta GA: PhD Candidate, Materials Science & Engineering (August 2007 – present).

- Dissertation research on the effect of plasma processing and annealing on the electrical and optical properties of colloidal indium tin oxide films.
- Related proficiencies: Colloidal synthesis, Impedance Spectroscopy, Atomic Force Microscopy (AFM), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Neutron Reflectometry, MATLAB.
- Minor: Microelectronics.
- GPA: 3.79. Expected graduation: December 2012.

Boston University, Boston, MA: Master of Science, Manufacturing Engineering (January 2002)

- Synthesized, characterized and tested cermet to develop a composite anode for the high temperature SOM (Solid Oxide Membrane) process (MS thesis).
- Analyzed assembly lines at Microtouch (now 3M Touch Systems), Methuen MA for sources of problems like rework and bottlenecks, conducted time studies and made recommendations for improvement as a part of a course project.

Indian Institute of Technology (I.I.T.), Mumbai, India: Bachelor of Technology, Metallurgical Engineering & Materials Science (June 1999)

- Synthesized Yttria-stabilized zirconia by sol-gel/coprecipitation, characterized it and studied its sintering.
- Fabricated, characterized and performed impedance analysis on ZnO varistors.

Work Experience

GE Global Research, John F. Welch Technology Center, Bangalore, India: Scientist (July 2005 – August 2007)

- Developed stain-resistant, low surface energy coatings for cooking appliances (US patent 7964294).
- Developed glass, ceramic compositions and glass-ceramic composites with tunable thermal expansion properties and resistance to plasma (RIE) etching and oxidation corrosion (Patent appl. US 2008/0142755 A1).
- Developed glass seal materials for use in high temperature sodium batteries.
- Developed sol-gel based coatings for halide plasma corrosion resistance.
- Developed process for fabricating porous SiOC membranes (Patent appl. US 2009/0252971 A1).
- Developed an experimental system for measuring rate of chromium volatilization from interconnect alloys in SOFC operating conditions.
- Synthesized phosphors for gamma ray scintillation detectors, and performed spectroscopic measurements on them.

Aspen Products Group, Inc., Marlborough, MA, USA: Project Engineer, Research & Development (October 2001 – September 2004)

- Developed a prototype device for removing carbon monoxide from natural gas steam reformate.
- Synthesized, tested and optimized absorbents and water gas shift catalysts. Developed and optimized regeneration processes for carbon dioxide absorbents.
- Automated control system and data acquisition for lab-scale test apparatuses using LabVIEW.
- Modeled thermal characteristics of the prototype reactor using Algor finite element modeling software.
- Performed troubleshooting, production data analysis and process improvement on the supercritical CO₂ extraction process of the aerogel pilot plant.

Publications & Conference Proceedings/Presentations

- S. M. Joshi, G. W. Book, and R.A. Gerhardt, *A comparative study of the effect of annealing and plasma treatments on the microstructure and properties of colloidal ITO films and cold-sputtered ITO films*. Thin Solid Films, 2012. **520**(7): p. 2723-2730.
- Oral presentation: *A comparative study of the effect of heat treatment on the properties of colloidal ITO films and cold-sputtered ITO films* at TMS 2010 Electronic Materials Conference, South Bend IN, 2010.
- S. M. Joshi, G. W. Book, and R.A. Gerhardt, *Effect of Substrate Type on the Electrical and Optical Properties of Cold-sputtered Indium Tin Oxide Films as a function of Post-deposition Heat Treatment*, MRS Proceedings, 1256, pp. 1256-N16-55, 2010.
- C. J. Capozzi, I. N. Ivanov, S. Joshi, and R. A. Gerhardt, *The effect of the atmosphere on the optical properties of as-synthesized colloidal indium tin oxide*. Nanotechnology, 2009. **20**(14): p. 145701.

Patents & Patent Applications

- V. S. Venkataramani, S. M. Joshi, N. Karkada, and S. Kumar, "Low surface energy stain-resistant oxycarbofluoride coatings for cooking appliances and utensils", US Patent 7964294 (2010).
- B. Vaidhyanathan, S. M. Joshi, S. K. Ramasesha, M. Nagesh, V. L. Lou, G. T. Dalakos, M. J. Wittbrodt, and D. Zhong, "Heater apparatus with long use time for semiconductor device fabrication and associated method", US patent application 2008/0142755.
- A. Saha, S. M. Joshi, and A.-P. Zhang, "Silicon oxycarbide ceramic membranes formed by etching through-pores in silicon oxycarbide layer on porous substrate", US patent application 2009/0252971.