

# Surya Moganty

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## EDUCATION:

<b>Cornell University</b> , Ithaca, NY	July 2009 – Feb 2011
Post Doctoral Associate: Chemical Engineering	
<b>Clarkson University</b> , Potsdam, NY	Aug 2006 - June 2009
PhD: Chemical Engineering	
<b>Indian Institute of Technology (IIT) Madras</b> , Chennai, India	Jan 2004 - May 2006
Master of Science (M.S): Chemical Engineering	
<b>Jawaharlal Nehru Technological University (JNTU)</b> , Hyderabad, India	Dec 1999 - May 2003
Bachelor of Technology (B.Tech): Chemical Engineering	

## WORK EXPERIENCE:

**NOHMs /Sionic Energy**, Rochester, NY Since Apr 2014

### Chief Technology Officer (CTO)

- Coordinating R&D activities to meet product roadmap performance targets for key customers
- Directing resources and effort for Ph.D. scientists, technicians, and development engineers
- Establishing and coordinating University and Industry joint R&D projects
- Informing and advising the executive staff on strategic decisions based on the technology roadmap

**NOHMs Technologies, Inc**, Ithaca, NY Mar 2012-Mar 2014

### Scientist

- Developing hybrid electrolyte materials for Lithium-metal batteries
- Evaluation of various composite materials for Lithium-Sulfur rechargeable batteries
- Advanced electrolyte development for Li-ion batteries

**Intel Corporation**, Portland, OR Feb 2011- Feb 2012

### Process Engineer, Chemical Mechanical Planarization (CMP)

- Developing CMP process which enables next generation 3-D transistor technology
- Evaluation of various abrasive slurries and planarization polymer pads for CMP process
- Documentation of process developments and transfer of developed process to High Volume Factories
- Mentor technicians to trouble shoot and conduct experiments for process improvements

## RESEARCH EXPERIENCE:

### Post Doc: Nano structured materials for Li Ion Batteries (LIBs)

- Electrochemical characterization of Sulfur incorporated novel hollow carbon materials as cathode materials
- Synthesis and investigation of Transition metal oxide nano-structures as electrode materials for LIBs
- Development of eco-friendly synthetic routes using ionic liquids (*Ionothermal methods*) for the LIB electrode material's synthesis

### Nano-materials based Novel Ionic Liquid Electrolytes

- Investigation of novel Ionic liquids as electrolytes for energy storage devices.
- Development of ionic liquid tethered nano-particle hybrid electrolytes for energy storage
- Synthesis of novel electrolytes based on poly (ionic liquids) & nanoparticle/ionic liquid composites for LIBs
- Characterization of Nano-scale organic hybrid electrolytes for energy storage devices

### Synthesis and characterization of rare earth based non-diffusional tracers for the enhanced oil recovery

- Synthesis and evaluation of different fluorescent rare earth fluoride nano-particles
- Development of Silica/Zirconia clad rare earth nano-particle tracers
- Evaluation of the developed non-diffusional tracers for oil field tests

### PhD: Synthesis and characterization of ionic liquids for gas separation applications (Sponsored by National Science Foundation, USA)

- Designed an experimental setup for measurement of gas solubilities and diffusivities in ionic liquids
- Synthesized 1-alkyl-3-butylimidazolium based ionic liquids for carbon dioxide (CO<sub>2</sub>) capture
- Developed diffusivity correlations for CO<sub>2</sub> in ionic liquid

### Characterization of electrochemical properties of ionic liquids

(Sponsored by National Science Foundation, USA)

- Investigated electrochemical stability windows for a number of electrode materials such as: Au, Pt, Ta, Cu, glassy carbon, and carbon nanotubes using cyclic voltammetry (CV)
- Characterized the interfacial behavior of ionic liquids between electrode materials by modeling the Electrochemical Impedance Spectroscopy (EIS) data
- Developed reference electrodes for ionic liquid systems
- Measured diffusion coefficient of ferrocene and its derivatives in various ionic liquids

### Synthesis of polymerizable ionic liquids for energy storage applications

- Synthesized low- $T_g$  polymerizable ionic liquids (poly(ILs)) with  $\text{BF}_4$  and  $\text{Tf}_2\text{N}$  anions
- Characterized multiwalled carbon nanotube composites with poly(ILs) for electrochemical double layer capacitors

M.S:

### Characterization of copper Chemical Mechanical Polishing (CMP)

(Sponsored by MHRD and IIT Madras, India)

- Investigated hydrazine as an inhibitor for nitric acid based slurries for Cu CMP
- Characterized arginine as a complexing agent in peroxide based slurries
- Electrochemical impedance spectroscopy and cyclic voltammetry techniques were used to understand the relative role played by the chemicals

PATENTS:

1. L. A. Archer, **S. S. Moganty**, Y. Lu "Ionic liquid tethered nano particle hybrid electrolytes"
2. **S. S. Moganty et al**, "Sulfur infused carbon materials for secondary rechargeable batteries"
3. **S. S. Moganty** and J. Lee, "Radiation cured poly(ionic liquid) membranes for electrochemical energy storage applications"
4. **S. S. Moganty** and G. Torres, "Functionalized ionic liquid combinations for secondary battery applications"
5. **S. S. Moganty** and V. Fabre, "Charge Control and Termination of Lithium Sulfur and Fuel Gauging Systems and Methods"

PUBLICATIONS:

- 1.
2. **S.S. Moganty**, et al., "Structure–Property Relationships in Transport and Thermodynamic Properties of Imidazolium Bistriflamide Ionic Liquids for  $\text{CO}_2$  Capture, *Chem Eng J*, 2014
3. L. Ma, H. Zhuang, S.S. Moganty, R. Henning, L. A. Archer, "Tethered molecular sorbents: Enabling metal-sulfur battery cathodes", Submitted to *Adv Energy Mater*.
4. Y-Y. Lu, S. Das, **S.S. Moganty**, L. A. Archer, "Ionic liquid nanoparticle hybrid electrolytes for Li ion secondary batteries", *Adv. Mater*, 24, 4430, 2012.
5. **S. S. Moganty**, S. Srivastava, J.L. Nugent, L.A.Archer, "Ionic Liquid-tethered Nanoparticle Suspensions", *Chem Mater*, 24, 1386, 2012.
6. Y-Y. Lu, **S. S. Moganty**, J.L. Schaefer, L.A. Archer, "Ionic liquid nano particle hybrid electrolytes", *J. Mater Chem*, 22, 406, 2012.
7. J.L. Nugent, Y-Y. Lu, **S.S. Moganty**, P. Agarwal, N. Jayaprakash, L.A. Archer, "Electrolytes for high-energy Lithium batteries", *Applied Nano Sci*, 91, 2, 2012.
8. J.J. Close, K. Farmer, **S. S. Moganty**, R.E. Baltus, "  $\text{CO}_2/\text{N}_2$  separation using nano porous alumina supported ionic liquid membranes: Effect of the support on separation performance", *J. Membrane Sci*, 390-391, 201, 2012.
9. N. Jayaprakash, **S. S. Moganty**, and L.A. Archer, "Composite lithium battery anodes based on  $\text{Carbon}@\text{CO}_3\text{O}_4$  composites: Synthesis and Characterization", *J Power Sources*, 200, 53, 2012.
10. N. Jayaprakash, J. Shen, **S. S. Moganty**, A.E. Alex and L.A. Archer, "Porous hollow carbon/sulfur composite for high power Lithium-Sulfur battery", *Angew. Chem. Int. Ed.* 50, 5904, 2011.
11. J.L. Nugent, **S. S. Moganty**, D.A. Yanga, and L.A. Archer, "Nanoporous hybrid electrolytes", *J. Mater. Chem.* 21, 10094, 2011.
12. N. Jayaprakash, **S. S. Moganty**, X.W. Lou and L.A. Archer, "Super fast Li ion insertion/deinsertion behavior of  $\text{C-Li}_4\text{Ti}_5\text{O}_{12}$  anode for lithium battery application", *Applied Nano Sciences*, 1, 7, 2011.
13. J. Zheng, **S. S. Moganty**, P.C. Goonetilleke, R.E. Baltus and D. Roy, "A Comparative study of the Electrochemical characteristics of  $\text{EmimBF}_4$  and  $\text{BmimBF}_4$  Ionic Liquids at the Surfaces of Carbon Nanotube (CNT) and Glassy carbon Electrodes", *J. Phys. Chem. C*, 115, 7527, 2011
14. **S. S. Moganty** and R.E. Baltus, "Diffusivity of Carbon dioxide in Room Temperature Ionic Liquids", *Ind. Eng. Chem. Res*, 49, 5846, 2010.

15. **S. S. Moganty**, N. Jayaprakash, J.L. Nugent, J. Shen and L.A. Archer, “ Ionic Liquid tethered Nanoparticle Hybrid Electrolytes”, *Angew. Chem. Int. Ed*, 49, 9158, 2010
16. J.L. Nugent, **S. S. Moganty** and L.A. Archer, “Nanoscale Organic Hybrid Electrolytes”, *Advanced Materials*, 22, 3677, 2010
17. **S. S. Moganty** and R.E. Baltus, “Regular solution theory for low pressure CO<sub>2</sub> solubilities in room temperature ionic liquids: Ionic liquid solubility parameter from activation energy of viscosity”, *Ind. Eng. Chem. Res*, 49, 5846, 2010
18. **S. S. Moganty**, R.E. Baltus and D. Roy, “ Electrochemical windows and impedance characteristics of [Bmim BF<sub>4</sub>] and [BmmimBF<sub>4</sub>] ionic liquids at the surfaces of Au, Pt, Ta and glassy carbon electrodes”, *Chem. Phys. Lett*, 483, 90, 2009
19. **S. S. Moganty** and S. Ramanathan, “Characterization of copper CMP in nitric acid and hydrazine based slurry for microelectronic fabrication”, *Thin Solid Films*, 504, 227, 2006