

Sujat Sen, Ph.D.

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Education

Ph.D. (Chemistry) , Brown University, Providence, RI, USA,	2014
Masters in Chemistry , Brown University, Providence, RI, USA	2010
Masters in Chemical Research (MSc) , University of Reading, Reading, UK	2008
Bachelors of Science (Honors), Chemistry , St. Stephen's College, Delhi University, India,	2007

Fellowships and Awards

ECS Edward. G. Weston Summer Fellowship , The Electrochemical Society, NJ, USA	2012
ECS Electrodeposition Division Travel Grant , (221 st meeting, Seattle, WA)	2012
Felix Scholarship , University of Reading, UK covering all tuition and living costs	2007
Awarded Scholarship for meritorious science students (Delhi University)	2005

Research Experience

Postdoctoral Appointee, Argonne National lab, Lemont, IL **April 2014-present**

Advisor: Dr. Elena V. Timofeeva, Energy Systems Division

Project title: *Prototype of Rechargeable Nanoelectrofuel Flow Battery for Electric Vehicle Systems with High Energy Density, Low Viscosity and Integrated Thermal Management Function under ARPA-E's RANGE program*

Graduate Research Assistant, Brown University, Providence, RI **2009-2014**

Advisor: Prof. G. Tayhas. R. Palmore, School of Engineering

Thesis title: *Electrochemical applications of conducting polymers and nanostructured metals*

Graduate Intern, Samsung Electronics, Giheung, South Korea **June-Aug. 2011**

Advisor: Dr. Kyungsuk (Peter) Pyun, Materials and Devices Lab, Samsung Advanced Institute of technology

Project title: *Photopolymeric nanocomposites for holographic display and printing*

Graduate Research Assistant, University of Reading, Reading, UK **2007-2008**

Advisor: Prof. F. J. Davis, Polymer research centre, Department of Chemistry

Thesis title: *Processing conducting polymers via electrospinning*

Undergraduate Intern, Deshbandhu College, University of Delhi, Delhi, India **May - July 2005**

Advisor: Dr. Man Singh, Department of Chemistry and Industrial Applications

Project title: *Design and calibration of a low-cost custom glass device, "the survismeter" capable of dual measurement of surface tension and viscosity*

Peer-reviewed publications

1. D. Deccicio, S. Ahn, **S. Sen**, C. R. Petruck, G. T. R. Palmore, "Electrochemical reduction of CO₂ with clathrate hydrate electrolytes and copper foam electrodes", *Electrochemistry Communications*, 2015, Accepted, *In press*

2. **S. Sen**, D. Liu, G. T. R. Palmore “Electrochemical reduction of CO₂ at copper nanofoams”, *ACS Catalysis*, 2014, 4 (16), pp 3091-3095
3. **S. Sen**, J. Saraidaridis, S. Y. Kim, G. T. R. Palmore “Viologens as charge carriers in a polymer-based battery anode”, *ACS Applied Materials & Interfaces*, 2013, 5 (16), pp7825-7830
4. **S.Sen**, S.Kim, S.Jin, L.Palmore, N.Jadhav, E.Chason, G.T.R.Palmore, “In-situ measurement of stress and ion dynamics in conducting polymers”, *ECS Transactions*, 2013, Vol.45, 22, 15-21
5. X.Liu, **S.Sen**, D.Geohegan, A. Kane, G. T. R. Palmore, R.Hurt, “Antioxidant deactivation on graphenic nanocarbon surfaces”, *Small*, Vol.7, No.19, 2011, 2775-2785
6. S.Y.Kim, **S.Sen**, H.K.Song, G.T.R.Palmore, “Enhancing the stability and performance of a battery cathode by using a non-aqueous electrolyte”, *Electrochemistry Communications*, 12, 2010, 761-764
7. G. R. Mitchell, M. Belal, F. J. Davis, D. E. Elliott, S. D. Mohan, R. H. Olley, **S. Sen**, “Defining structure in electrospun polymer fibers”, *Advanced Materials Research*, Vols. 55-57, 2008, pp 33-36
8. **S. Sen**, F. J. Davis, G. R. Mitchell, E. Robinson, “Conducting nanofibers produced by electrospinning”, *Journal of Physics: Conference Series* 183, 2009, 012020
9. S. Mohan, **S. Sen**, G. R. Mitchell, R. H. Olley, F. J. Davis, “Electrospinning atactic polystyrene: A neutron scattering study”, *Journal of Physics: Conference Series* 183, 2009, 012019

Research Proposals

1. *Principal Investigator*, General User Proposal (GUP 39809), 2014-2015, Advanced Photon Source, Argonne National Labs, “Electrochemical Conversion of CO₂ to Liquid Fuels: Improving Selectivity with Model Catalysts and in-situ XAS Approach”

Presentations (* denotes presenter)

1. **S. Sen***, “In-situ measurement of stress evolution in polymer composites”, *Department of Physics, Illinois Institute of technology, Chicago, IL, Invited talk, Nov. 6th, 2014*
2. **S. Sen***, V. Govindarajan, C. Pelliccione, E. V. Timofeeva and Dileep Singh “Enhanced colloidal stability of aqueous titania nanofluids by surface modification”, *7th Annual Research and Career Symposium, Oct. 23rd 2014, Argonne National lab (poster)*
3. **S. Sen**, D. Liu, G.T R. Palmore*, “Electroreduction of CO₂ at Cu and Sn electrodes”, *225th ECS meeting, Orlando, FL, May 2014, (Oral)*
4. **S. Sen***, D. Liu, G.T R. Palmore, “Electrocatalytic reduction of CO₂ at highly porous copper foam electrodes”, *247th ACS national meeting, Dallas, TX, March 2014 (Oral)*
5. **S. Sen***, D. Liu, G.T R. Palmore, “Electrocatalytic reduction of CO₂ at highly porous tin foam electrodes”, *247th ACS national meeting, Dallas, TX, March 2014 (poster)*
6. **S. Sen**, “Stress evolution and ion dynamics in redox-active polypyrrole film”, *Interface(ECS), Vol.21, 3-4, 88-91, 2012*
7. **S. Sen**, S. Kim, S. Jin, L. Palmore, N. Jadhav, E. Chason, G. T. R. Palmore*, “Stress evolution and ion dynamics in conducting polymers”, *Gordon Research Conference on Polymer Physics, Mount Holyoke College, MA, 2012 (poster)*
8. **S. Sen***, S. Kim, S. Jin, L. Palmore, N. Jadhav, E. Chason, G. T. R. Palmore, “In-situ measurement of stress evolution in conducting polymers”, *221st ECS meeting, 2012, Seattle, WA, (Oral)*
9. **S. Sen***, S. Kim, S. Jin, L. Palmore, N. Jadhav, E. Chason, G. T. R. Palmore, “Ion dynamics in conducting polymers”, *MRS spring meeting, 2012, San Francisco, CA, (Oral)*
10. **S. Sen***, J. Saraidaridis, S. Y. Kim, G. T. R. Palmore, “Viologen modified conducting polymers : A polymer based battery anode”, *MRS fall meeting, 2012, Boston, MA, (Oral)*
11. X. Liu, **S. Sen**, D. Geohegan, A. Kane, G. T. R. Palmore, R. Hurt*, “Nanotoxicology: Depletion of antioxidants by heterogeneous catalysis on carbon surfaces”, *Proceedings of the American Carbon Society, July 2010*

Media Coverage

<https://news.brown.edu/articles/2014/08/copper>, August 12th 2014

<http://www.greencarcongress.com/2014/08/20130813-palmore.html>, August 13th 2014

<http://www.physnews.com/nano-materials-news/cluster987048882/>, August 13th 2014

Professional membership

- American Chemical Society (ACS) **2008-present**
- Materials Research Society (MRS), *Member of mentorship program* **2011-present**
- Electrochemical Society (ECS), **2011-present**
- International Society of Electrochemistry (ISE) **2012-present**

Teaching and Mentorship Experience

Graduate Teaching Assistant, Brown University, Providence, RI **2008- 2009**

Graduate TA for Chem 0350 (Introductory Organic chemistry-I) and Chem. 0360 (Organic chemistry-II)

Major topics taught: Organic reaction mechanism, Spectroscopy (UV-Vis, FTIR, NMR), Micro-scale preparative and analytical techniques, GC/LC-MS, Duties included:

- Independently conduct regular lab sessions (twice a week, ~20 students per session),
- Grading weekly lab reports and quizzes, mid-terms and final exams
- Regular office hours to discuss course and lab work.

Undergraduate Teaching and Research (UTRA) student, *honors thesis*, Brown University **2009-2011**

Primary mentor, Undergraduate student Mr. James Saraidaridis

Undergraduate Research Assistant *honors thesis*, Brown University **2011-2012**

Primary Mentor, Undergraduate student Ms. Shenghua (Kelly) Jin

Science Undergraduate Laboratory Internships (SULI), Department of Energy, ANL **Jun.-Aug.2014**

Mentor, Undergraduate student Mr. Vijay Govindarajan

Science Undergraduate Laboratory Internships (SULI), Department of Energy, ANL **Jan.2015-present**

Mentor, Undergraduate student, Mr. Chun Man Chow