

## Thomas M. Arruda

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### Education

**University of Massachusetts** (N. Dartmouth, MA)

B.S. in Chemistry, Cum Laude, January 2004

Undergraduate research advisor: Russell Bessette

**Northeastern University** (Boston, MA)

Ph.D. in Chemistry, *anticipated* August 2009

Thesis in physical chemistry with Sanjeev Mukerjee

Title: In situ X-ray absorption studies on the stability and activity of fuel cell electrocatalyst: PEMFC and Biofuel cell materials

### Appointments

2006-present      **Research Assistant**  
Northeastern University, Boston, MA

2004-2006        **Teaching Assistant**  
Northeastern University, Boston, MA

2003-2004        **Teaching Assistant**  
University of Massachusetts, N. Dartmouth, Ma

### Awards

2009              Chemistry Graduate Leadership Award (NU)

2004              Brian A. Rose Award (UMASS Dartmouth)

2003              American Chemical Society Analytical Division Award

### Publications

Shyam, B.; **Arruda, T. M.**; Mukerjee, S.; Ramaker, D. E, Effect of RuOxHy Island Size on PtRu Particle Aging in Methanol, *J. Phys. Chem. C*, Submitted 2009

Ramaswamy, N.; **Arruda, T. M.**; Wen, W.; Hakim, N.; Saha, M.; Gulla, A.; Mukerjee, S., Enhanced Activity and Interfacial Durability Study of Ultra Low Pt Based Electrocatalysts Prepared by Ion Beam Assisted Deposition (IBAD) Method, *Electrochim. Acta*, **Accepted** (2009)

Mukerjee, S.; Ziegelbauer, J.; **Arruda, T.**; Ramaker, D.E.; Shyam, B., Understanding Electrocatalytic Pathways in Low and Medium Temperature Fuel Cells: Synchrotron-based in Situ X-ray Absorption Spectroscopy, *Interface*, **17**(4), 46, (2008)

**Arruda, T. M.**; Shyam, B.; Ziegelbauer, J. M.; Ramaker, D. E.; Mukerjee, S., Investigation into the Competitive and Site-Specific Nature of Anion Adsorption on Pt Using In Situ X-ray Absorption Spectroscopy, *J.Phys.Chem.C*, **112**, 18087-18097 (2008)

**Arruda, T. M.**, Shyam, B., Ziegelbauer, J. M., Ramaker, D., Mukerjee, S., In situ XAS Investigation of Electrocatalyst Poisoning by Halides, *ECS Transactions*, **11**(1) 903-911, (2007).

Shyam, B., **Arruda, T.**, Ziegelbauer, J. M., Mukerjee, S., Ramaker, D. E., Observation of PtRu Particle Aging in Methanol with X-ray Absorption Spectroscopy, *ECS Transactions*, **11**, 1, 1359, (2007).

Patrissi, C. J., Bessette, R. R., Carreiro, L. G., Kim, Y. K., **Arruda, T. M.**, Deschenes, C. M., Method for Increasing Fiber Density in Electrostatic Flocking, U. S. Patent 7,354,626, 2008.

Bessette, R. R., **Arruda, T. M.**, Patrissi, C. J., Tucker, S. P., Carreiro, L. G., Medeiros, M. G., Deschenes, C. M., Catalysis, Architecture and the Electrochemical Performance of Microfibrous Cathodes for Hydrogen Peroxide-Based Fuel Cells, *Proceedings of the Power Sources Conference*, **41<sup>st</sup>**, 424-427, (2004).

## **Presentations**

'In Situ Investigations into the Interaction of Laccase and Os Mediators for Biological Fuel Cells', **T.Arruda**, Deboleena Chakraborty, S. C. Barton and S. Mukerjee, *Symposium on Physical, Analytical and Spectro-Electrochemical Characterization (II)*, #2759, 214<sup>th</sup> Meeting of the Electrochemical Society, Honolulu, HI, 2008

‘In Situ XAS Investigation of Novel Osmium-Based Redox Polymer Mediators for Laccase-Based Biological Fuel Cells’, **T. Arruda**, Deboleena Chakraborty, S. C. Barton and S. Mukerjee, *Symposium on Biological Fuel Cells 3 (B3)*, #249, 213<sup>th</sup> Meeting of the Electrochemical Society, Phoenix, AZ, 2008

‘The Spontaneous Deposition of Ru Onto Pt/C Electrocatalyst: An In-Situ XAS Study’, **T. Arruda**, B. Shyam, V. Murthi, D. Ramaker and S. Mukerjee, *Symposium of Fundamentals of Energy Storage and Conversion (B5)*, #312, 213<sup>th</sup> Meeting of the Electrochemical Society, Phoenix, AZ, 2008

‘In Situ XAS Investigation of Electrocatalyst Poisoning by Halides’, **T. Arruda**, J. Ziegelbauer, B. Shyam, D. Ramaker and S. Mukerjee, *Symposium on Proton Exchange Membrane Fuel Cells 7 (B10)*, #443, 212<sup>th</sup> Meeting of the Electrochemical Society, Washington DC, 2007

#### *Invited Talks*

‘XAS and EPR Investigations of Laccase as a Potential Electrocatalyst for Biological Fuel Cells’, T. Arruda, *National Synchrotron Light Source Lunch Seminar*, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY, 11/2008