Nuwan Harsha Attanayake

Department of Chemistry
University of Kentucky
Lexington, KY, 40506
(859)-489-6138
harsha.attanayake@uky.edu

Education

University of Kentucky, Lexington, KY, USA — Expected Graduation: 2020
Ph.D. student in Chemistry, Advisor: Prof. Susan A. Odom

University of Peradeniya, Sri Lanka
B.S. Chemistry, 2013, Advisor: Prof. H.M.N. Bandara — 2009-2013
Thesis title: Chemical Modification of Rubber to Obtain a Conducting Polymer

Research Experience

University of Kentucky
Developing highly soluble, stable electro-active organic compounds for non-aqueous redox flow batteries, high oxidation potential redox shuttles for over charge protection of Li-ion batteries. Laboratory work includes organic synthesis and characterization, electrochemical and spectroscopic analysis. (December 2015 - present)

University of Peradeniya
Developed a conjugated back bone on natural rubber in order to obtain a conducting polymer through chemical modification followed by doping with oxidants. Work involved organic/polymer synthesis and characterization, electrochemical and spectroscopic analysis. (2012/2013)

Research Mentoring Experience

Train and supervise undergraduate and junior graduate students in laboratory research activities including organic synthesis, characterization and electrochemical analysis. (June 2016 - present)

Scholarships

1) The Chair's Scholarship from the department of chemistry, University of Kentucky, for the outstanding undergraduate record and the high recommendations on the academic performance, scientific capabilities, and accomplishments, November, 2015.

Awards

2) The outstanding poster presentation, (Tittle: Molecular Designing Strategies for High-Capacity Electrolytes in Non-Aqueous Redox Flow Batteries), KY NSF EPSCoR, February 23, 2018.

1) The Outstanding Oral Qualifier Award, Department of Chemistry, University of Kentucky, January 2018

Teaching Experience

University of Kentucky
Organic Chemistry Laboratory I and II, Teaching Assistant, August 2015 - May 2016

University of Peradeniya

Elementary Chemistry Laboratory, Teaching Assistant, April 2013 – September 2014
Organic Chemistry Laboratory, Teaching Assistant, October 2013 – February 2014

Publications

3) **"Doubling up: Increasing Charge Storage in Organic Donors and Acceptors for Non-Aqueous Redox Flow Batteries."** Odom, S. A.; Kaur, A. P.; Casselman, M. D.; Attanayake, N. H.; Anthony, J., & Brushett, F. R. *ECS Transactions*, 2017, *77*(11), 145-151.

2) **"A Stable Two-Electron-Donating Phenothiazine for Application in Nonaqueous Redox Flow Batteries."** Kowalski, J.A.; Casselman, M.D.; Kaur, A.P.; Milshtein, J.D.; Elliott, C.F.; Modekrutti, S.; Attanayake, N.H.; Zhang, N.; Parkin, S.R.; Risko, C.; Brushett, F.R.; Odom, S.A., *J. Mater. Chem. A* **2017**, *5*, 24371-24379.

1) **"High current density, long duration cycling of soluble organic active species for non-aqueous redox flow batteries."** Milshtein, J. D.; Kaur, A. P.; Casselman, M. D.; Kowalski, J. A.; Modekrutti, S.; Zhang, P. L.; Attanayake, N. H.; Elliott, C. F.; Parkin, S. R.; Risko, C.; Brushett, F.R.; Odom, S.A. *Energy & Environmental Science* **2016,** *9*(11), 3531-3543.

Patent Applications

2) **"Two-Electron Donating Phenothiazines and Use Thereof."** Odom, S.A.; Aman Preet Kaur.; Casselman, M.D.; Attanayake, N.H.; 13177N/2126US, filled on October 25, 2017.

1) "**1,9,10-Substituted Phenothiazine Derivatives with Strained Radical Cations and Use Thereof**." Odom, S.A.; Risko, C.; Casselman, M.D.; Elliott, C.F.; Attanayake, N.H.; Modekrutti, S., provisional patent application, filled on July 19, 2017.

Conference Proceedings

7) "**Tailoring Organic Redox Couples for Non-Aqueous Redox Flow Batteries."** Attanayake, N.H.; Barton, J.D.; Casselman, M. D.; Elliott, C.F.; Kaur, A. P.; Kowalski, J. A.; Milshtein, J. D.; Anthony, J.; Brushett, F.R.; Landon, J.; Odom, S.A., The *Electrochemical Society*: **2018**; pp 228-228 (accepted for a talk).

6) "**Towards the application of phenothiazine-based positive electrolytes for non-aqueous redox flow batteries."** Attanayake, N.H.; Kowalski, J. A.; Kaur, A. P.; Milshtein, J. D.; Casselman, M. D.; Katharine Greco.; Parkin, S.R. Brushett, F.R.; Odom, S.A., *Gordon Research Seminar and Gordon Research Conference*, **2018.** (poster)

5) "**Molecular Designing Strategies for High-Capacity Electrolytes in Non-Aqueous Redox Flow Batteries."** Attanayake, N.H.; Kowalski, J. A.; Kaur, A. P.; Milshtein, J. D.; Casselman, M. D.; Katharine Greco.; Parkin, S.R. Brushett, F.R.; Odom, S.A., *International Summit of MRS University Chapters on "Nanotechnology and Sustainability*, **2017,** Control ID: ISUCNS-23. (poster)

4) **"A Highly Soluble, Two-Electron Donor for Non-Aqueous Redox Flow Batteries."** Attanayake, N.H.; Kowalski, J. A.; Milshtein, J. D.; Kaur, A. P.; Casselman, M. D.; Parkin, S.R.; Risko, C.; Brushett, F.R.; Odom, S.A., *Materials Research Society*, **2017**, Control ID: 2802517. (poster)

3) **"Harnessing Strain to Raise Oxidation Potentials in Organic Electroactive Materials."** Attanayake, N.H.; Elliott, C.F.; Casselman, M.D.; Risko, C.; Parkin, S.R.; Odom, S.A., *Materials Research Society*, **2017**, Control ID: 2802922. (oral)

2)**"Toward Soluble, Stable Organic Electroactive Materials for Non-Aqueous Redox Flow Batteries."** Odom, S. A.; Kaur, A. P.; Attanayake, N.H.; Casselman, M. D.; Milshtein, J. D.; Kowalski, J. A.; Elliott, C. F.; Parkin, S. R.; Risko, C.; Anthony, J.; Brushett, F.R., *Electrochemical Society*: **2017**; pp 14-14.

1) **"In Robust Electron-Donating Organic Compounds for Non-Aqueous Redox Flow Batteries."** Odom, S. A.; Kaur, A. P.; Casselman, M. D.; Elliott, C. F.; Attanayake, N. H.; Parkin, S. R.; Risko, C., The *Electrochemical Society*: **2016**; pp 761-761.

Presentations

6) "Molecular Designing Strategies for High-Capacity Electrolytes in Non-Aqueous Redox Flow Batteries." Attanayake, N.H.; Kowalski, J. A.; Kaur, A. P.; Milshtein, J. D.; Casselman, M. D.; Katharine Greco.; Parkin, S.R. Brushett, F.R.; Odom, S.A., Super Collider Meeting, KY NSF EPSCoR, February 23, 2018. (poster)

5) ''Stable, High-Capacity Electrolytes for Non-Aqueous Redox Flow Batteries." MRS-UK chapter, Oliver H. Raymond Civil Engineering Building, UK, Lexington, KY, June 12, 2017. (oral)

4) "Development of Polyurethane Based Commercial Paints." Department of Chemistry, University of Peradeniya, Sri Lanka, May, 2013. (oral)

3) ''Stable, High-Capacity Electrolytes for Non-Aqueous Redox Flow Batteries." NSF EPSCoR Site Visit Student Poster Session, Lexington, KY, August 15, 2017. (poster)

2) "Chemical Modification of Natural Rubber to develop a conducting polymer." Department of Chemistry, University of Peradeniya, Sri Lanka, December, 2013. (poster)

1) "Anti-Diabetic Natural Products and Treatments." Department of Chemistry, University of Peradeniya, Sri Lanka, November, 2012. (oral)

Professional Memberships

Materials Research Society (member, June 2017 - present)

Electrochemical Society (member, June 2017 - present)

Volunteer Experience

2) Teachers Training Workshop, Science Education Unit, University of Peradeniya, Sri Lanka, November 18, 2014-November 21, 2014.

1) Chemical Demonstrations for high school students, University of Peradeniya, Sri Lanka, September 10, 2014.