Lakshitha Pahalagedara (PhD)

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SUMMARY

Materials scientist with teaching and interdisciplinary research experiences in the areas of environmental, energy, and sustainability.

Highlights

Mentored four post - graduate students, five undergraduate students, two research interns, and one high school student in the laboratory and assisted and guided them in making research posters and writing thesis.

Volunteered as a mentor for University of Connecticut – REU program (2012, 2013) and ACS Chemistry Olympiad program (2011).

Proficient at training undergraduates and post - graduate students on N_2 sorption studies, SEM, FTIR, UV-Vis, TGA-DRS analysis, and microwave-assisted synthesis.

Expertise in polymer and surfactant assisted synthesis, processing and characterization of metal oxide nanomaterials and thin film coatings.

Experienced in electrochemical catalytic water splitting.

Adept in analysis of structure, morphology, and mechanical properties of carbonaceous materials using X-ray diffraction, adsorption studies, spectroscopic methods, and electron microscopy.

Expertise in gas and liquid phase sulfur removal processes. Experienced in writing proposals, patent application process and peer-reviewing process.

Expertise in correlating physical-chemical properties of materials with catalytic applications and product analysis with mass spectrometry and gas chromatography.

Adept in planning and completing projects, presenting progress reports and scientific data meeting all project timelines and exceptional communication skills in team work.

Specialties

Materials characterization: XRD, FESEM, nitrogen sorption methods, EDX, FT-IR, Raman, AAS, ICPAES, UV-Vis, TGA, and DRS. Separation methods: gas chromatography (GC-TCD, GC-FID, GC-FPD, GC-MS) and mass spectrometry (MS)

EDUCATIONAL QUALIFICATIONS

Ph.D. in Chemistry 2010 - 2015
University of Connecticut, Storrs, CT, USA
Thesis: design, synthesis and characterization of transition metal oxide nanomaterials as efficient sorbents and emerging catalysts and investigation of carbon structure-oxidation activity correlations

B.Sc. in Chemistry (Honors) 2005 - 2009
University of Peradeniya, Sri Lanka

Thesis: Carbon dioxide adsorption via chlorophyll derived metal porphyrin complexes.

HONORS AND AWARDS

Recipient, Graduate Dissertation Fellowship 2014

University of Connecticut, Storrs, CT, USA

PROFESSIONAL EXPERIENCE

Head of Business Development 2018 - Present
Sri Lanka Institute of Nanotechnology, Sri Lanka

Post – Doctoral Fellow 2015 -2018
Sri Lanka Institute of Nanotechnology, Sri Lanka

RESEARCH EXPERIENCE

Post – Doctoral Fellow 2015 - 2018
Sri Lanka Institute of Nanotechnology, Sri Lanka

Formulation and fabrication of Development of conductive fabric for smart textile applications.

Graduate Research Assistant 2010 - 2015
University of Connecticut, Storrs, CT, USA

Fabricated inorganic transition metal oxide and metal sulfide nanocatalysts with controlled shape, size, lattice parameters, and growth direction using both surfactant assisted and surfactant free routes for gas phase desulfurization and renewable energy production.

Developed a novel microwave-assisted hydrothermal synthesis method to control lattice parameters and direction of crystal growth for highly active manganese oxide octahedral molecular sieve materials as heterogeneous catalysts.

Developed green catalysts and sorbents for low temperature diesel engine soot oxidation and gas phase sulfur sorption using atomic layer deposition (ALD) and microwave assisted hydrothermal methods.

Analyzed chemical and physical nature and the activity of Diesel soot samples and developed soot structure-activity relationships as applied to Diesel particulate filter (DPF) regeneration.

Administration and development of research group website.

Assembled diesel soot oxidation set-up and gas phase desulfurization reactor.

Acting as lab safety personal and helping in maintaining a risk free environment in the lab.

INDUSTRY EXPERIENCE

Graduate Research Assistant 2014-2015
Exxon Mobil/ Department of Chemistry, UConn, USA

Fabricated manganese oxide nanocatalysts and established a set of relations between surface active sites and catalytic activity for total oxidation of CO and partial oxidation of CH_4.

Graduate Research Assistant 2012-2013
Fuel Cell Energy/ Center for Clean Energy Engineering, UConn, USA

Developed ex-situ gas analysis methods for polymer electrolyte fuel cells using gas chromatographic techniques.

Graduate Research Assistant 2011-2012
Corning Incorporated/ Center for Clean Energy Engineering, UConn, USA

Comprehensive investigation of structure and oxidation activity correlations for carbon black and diesel soot under non catalytic conditions for the improved design and operation of diesel particulate filters (DPFs).

Research Intern
2008
Brandix Lanka Limited, Sri Lanka

Developed and implemented an efficient, environmental-benign, and a cost effective treatment method for the wastewater treatment plant.

TEACHING EXPERIENCE

Graduate Teaching Assistant 2010 - 2015
University of Connecticut, Storrs, CT, USA

Conducted general chemistry laboratory and discussion sessions for the first year undergraduate students.

Graduate Teaching Assistant 2009 - 2010
University of Peradeniya, Sri Lanka

Oversaw second year and third year Inorganic chemistry laboratory sessions and conducted discussion sessions for the first year undergraduate students.

PROFESSIONAL AFFILIATIONS

American Chemical Society 2014 - Present
Catalysis Science & Technology Division

PATENTS

1.**Pahalagedara, L.**; Dharmarathna, S.; Suib, S. L. Method for Removing Soot from Exhaust Gases. United States Patent and Trademark Office, US Patent Application 62/093,180, Patent Pending, Dec. 2014.

2.Kuo, C-H.; **Pahalagedara, L. R.**; Suib, S. L. Adsorptive Desulfurization. United States Patent and Trademark Office, US Patent Application 62/093,196, Patent Pending, Dec. 2014.

3.Pahalagedara, M. N.; Dharmarathna, S.; **Pahalagedara, L. R.**; Suib, S. L. Adsorptive Desulfurization Method. United States Patent and Trademark Office, US Patent Application 65/077,535. Patent Pending, Nov. 2014

PUBLICATIONS

1.**Pahalagedara, L. R.**; Sharma, H.; Kuo, C-H.; Dharmarathna, S.; Joshi, A.; Suib, S. L.; Mhadeshwar, A. B. Structure and oxidation activity correlations for carbon blacks and diesel Soot. Energy Fuels 2012, 26, 6757-6764.

2.**Pahalagedara, L. R.**; Dharmarathna, S.; King'ondu.; C. K.; Pahalagedara, M. N.; Meng, Y.; Kuo, CH.; Suib, S. L. Microwave-Assisted Hydrothermal Synthesis of α-MnO2: Lattice Expansion via Rapid Temperature Ramping and Framework Substitution. J. Phys. Chem. C 2014, 118 (35), 20363–20373.

3.**Pahalagedara, L. R.**; Poyraz, A. S.; Song, W.; Kuo, C-H.; Pahalagedara, M. N.; Meng, Y.; Suib, S. L. Low temperature Desulfurization of H_2S: High sorption capacities by mesoporous cobalt oxide via increased H_2S diffusion. Chem. Mater. 2014, 26, 6613-6621.

4. **Pahalagedara, L. R.**; Kriz, D. A.; Wasalathanthri, N.; Weerakkody, C.; Meng, Y.; Dissanayake, S.; Pahalagedara, M. N.; Luo, Z.; Suib, S. L.; Nandi, P.; Meyer, R. J. Benchmarking of manganese oxide materials with CO oxidation as catalysts for low temperature selective oxidation, Appl. Catal. B. Environ. 2017, 204, 411-420.

5.Sharma, H.; **Pahalagedara, L. R.**; Joshi, A.; Suib, S. L.; Mhadeshwar, A. B. Experimental study of carbon black and diesel engine soot oxidation kinetics using thermogravimetric analysis. Energy Fuels 2012, 26, 5613–5625.

6.Dharmarathna, S.; King'ondu.; C. K.; Pedrick, W.; **Pahalagedara, L.**; Suib, S.L. Direct Sonochemical Synthesis of manganese octahedral molecular sieve (OMS-2) nanomaterials using cosolvent systems, their characterization, and catalytic applications. Chem. Mater. 2012, 24, 705-712.

7.Dharmarathna, S.; King'ondu.; C. K.; **Pahalagedara, L.**; Kuo, C-H.; Zhang, Y.; Suib, S. L. Manganese octahedral molecular sieve (OMS-2) catalysts for selective aerobic oxidation of thiols to disulfides, Appl. Catal. B: environ. 2014, 147, 124-131.

8.Kuo, C-H.; Poyraz, A. S.; Jin, L.; Meng, Y.; **Pahalagedara, L.**; Chen, S-Y., Kriz, D.; Guild, C.; Gudz, A.; Suib, S. L. Heterogeneous acidic TiO2 nanoparticles for efficient conversion of biomass derived carbohydrates. Green. Chem. 2014, 16, 785-791.

9.Pahalagedara, M.N.; **Pahalagedara, L. R.**; Kuo, C-H.; Dharmarathna, S.; Suib, S. L. Ordered Mesoporous Mixed Metal Oxides: Remarkable Effect of Pore Size on Catalytic Activity. Langmuir 2014, 30, 8228-8237.

10.Pahalagedara, M.N.; Samaraweera, M.; Dharmarathna, S.; Kuo, C-H.; **Pahalagedara, L. R.**; Gascon. J.; Suib, S. L. Removal of Azo Dyes: Intercalation into Sonochemically Synthesized NiAl Layered Double Hydroxide. J. Phys. Chem. C, 2014, 118 (31), 17801–17809.

11.Kuo, C-H.; Li, W.; **Pahalagedara, L.**; El-Sawy, A. M.; Kriz, D.; Genz, N.; Guild, C.; Ressler, T.; Suib, S. L.*; He, J.* Understanding the Role of Gold Nanoparticles in Enhancing the Catalytic Activity of Manganese Oxides in Water Oxidation Reactions, Angew. Chem. Int. Ed. 2014, 126, 1-7.

12. Pahalagedara, M. N.; **Pahalagedara, L. R.**; He, J.; Miao, R.; Gottlieb, B.; Rathnayake, D.; Suib, S. L. Room temperature selective reduction of nitrobenzene to azoxybenzene over magnetically separable urchin-like Ni/Graphene nanocomposites, J. Catal. 2016, 336, 41-48.

13. Pahalagedara, M. N.; **Pahalagedara, L. R.**; Kriz, D.; Chen, S-Y.; Beaulieu, F.; Thalgaspitiya, W.; Suib, S. L. Copper aluminum mixed oxide (CuAl MO) catalyst: A green approach for the one-pot synthesis of imines under solvent-free conditions, Appl. Catal. B. Environ. 2016, 188, 227-234.

14. **Pahalagedara, L. R.;** Siriwardane, I. W.;, Tissera, N.; Wijesena, R. and de Silva, K. M. N. Carbon Black Functionalized Stretchable Conductive Fabrics for Wearable Heating Applications, ***RSC Adv.***, 2017,**7**, 19174-19180

15.**Pahalagedara, L. R.**; Dharmarathna, S.; Wasalathanthri, N.; Pahalagedara, M. N.; Kuo, C-H.; Garces, F.; Suib, S. L. Low temperature diesel soot oxidation by Pt and Co doped manganese oxide octahedral molecular sieves. (In preparation)

PRESENTATIONS

1.**Pahalagedara, L.**; Sharma, H; Kuo, C-H.; Dharmarathna, S.; Joshi, A.; Suib , S.L.; Mhadeshwar, A. B. Influence of Particle Size and Microstructure On the Oxidation Behavior of Carbon Blacks and Diesel Soot, 12 th AIChE Meeting, Pittsburgh, PA, October 28 – November 3, 2012.

2.**Pahalagedara, L. R.**; Dharmarathna, S.; Kuo, C-H.; Sharma, H.; Joshi, A.; Suib, S. L.; Mhadeshwar, A. B.; Comparative Analysis of the Structure and Chemical Nature of Carbon Blacks and Diesel Soot , 12 th AIChE Meeting, Pittsburgh, PA, October 28 – November 3, 2012.

3.**Pahalagedara, L. R.**; Dharmarathna, S.; King'ondu.; C. K.; Pahalagedara, M. N.; Meng, Y.; Kuo, CH.; Suib, S. L. α-MnO2 lattice expansion by rapid temperature ramping: A case of Jahn-Teller distortion, 248th ACS National Meeting & Exposition, San Francisco, CA, August 10-14, 2014.

4.Pahalagedara, M. N.; **Pahalagedara, L. R.**; Dharmarathna, S.; Kuo, C-H.; Suib, S. L. Ca-Al layered double hydroxides (LDH) as a potential sorbent for fuel desulfurization: Application to the removal of dibenzothiophene, 248th ACS National Meeting & Exposition, San Francisco, CA, August 10-14, 2014.

REFRENCES

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