Gayan Rubasinghege, PhD

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EDUCATION

Doctor of Philosophy with Professor Vicki Grassian, Chemistry with Environmental Chemistry specialization, 2011, University of Iowa, Iowa City, IA
Dissertation: Chemical and photochemical reactions on mineral oxide surfaces in gaseous and liquid phases: Environmental implications of fate, transport and climatic impacts of mineral dust aerosol.

Bachelor of Science with Highest Honors, Major in Chemistry, 2005, University of Kelaniya, Sri Lanka.
Thesis: Physicochemical changes of stored cowpea, Vigna unguiculata, treated with selected essential oils to control cowpea bruchid, Callosobruchus maculatus. (Thesis advisor: Professor Priyani Paranagama)

POSITIONS

2014 – to date	Assistant Professor – Dept. of Chemistry, New Mexico Tech, Socorro, NM
2013 – 2014	Assistant Professor – Dept. of Chemistry, St. Cloud State University, MN
2011 – 2013	Visiting Assistant Professor, Dept. of Chemistry, University of Iowa, IA
2011 – 2013	Post-Doctoral Research Fellow, Dept. of Chemistry, University of Iowa, IA
2007 – 2008	Graduate Teaching Assistant, Dept. of Chemistry, University of Iowa, IA
2008 – 2011	Graduate Research Assistant, Dept. of Chemistry, University of Iowa, IA
2006 – 2007	Lecturer, Dept. of Chemistry, University of Kelaniya, Sri Lanka
2005 – 2006	Assistant Lecturer, Dept. of Chemistry, University of Kelaniya, Sri Lanka

HONORS AND AWARDS

2019	Invited speaker at the American Chemical Society (ACS) National Meeting, San Diego, CA
2018	Invited speaker at the American Chemical Society (ACS) National Meeting, Boston, MA
2012	Nominee for the Graduate College D.C. Spriestersbach Dissertation Prize – University of Iowa
2010	A. Lynn Anderson Award for Excellence in Graduate Research – University of Iowa
2010	First Place Presentation Award in Mathematical and Physical Sciences James F. Jacobson Graduate Conference
2010	Graduate Student Fellowship
2006	Gold Medal for the Inter-university Chemistry Competition organized by Royal Society of Chemistry – SL Division.
2005	Gold Medal for the Best Performance in the Faculty of Science at the B.Sc. Degree Examinations, University of Kelaniya. Sri Lanka.
2005	Gold Medal for the Best Results in Chemistry at the B.Sc. (Special) Degree Program, University of Kelaniya. Sri Lanka.

TEACHING

1. CHEM 121– General Chemistry I
2. CHEM 121R – General Chemistry I Recitation
3. CHEM 122 – General Chemistry II
4. CHEM 122R – General Chemistry II Recitation
5. CHEM 311 – Quantitative Chemical Analysis
6. CHEM 422/522 - Environmental Chemistry
7. CHEM 491 – Environmental Toxicology
8. CHEM 493/494 – Senior Research Thesis
9. CHEM 528 – Surface Chemistry and Heterogeneous Processes
10. CHEM 529 – Graduate Seminar

MENTORING

Graduate Students

1. Eshani Hettiarachchi, PhD candidate, graduation expected in May 2020
2. Nishanthi Ellepola, PhD candidate, graduation expected in August 2022
3. Milton Das, PhD candidate, graduation expected in August 2022
4. Hom Nath Rijal, MS, 2018 – PhD student in Chemistry, University of Miami, FL
5. Omar Hurub - General Manager of GRH Company, Yemen.

Undergraduate Students

1. Omar Ordonez‡, Chemistry, NMT
2. Dean Ortiz, Chemistry, NMT
3. Sabino Maldonado-Torres‡, BioMedical Science, NMT – Medical Student at UNM School of Medicine (won the first place at New Mexico INBRE symposium for his oral presentation in 2016, completed summer research internships at Yale University and Harvard)
4. Andrew Chan‡, Petroleum Engineering, NMT
5. Omar Hurub, Chemistry, NMT (Senior Thesis)
6. Chase Kicker, Material Engineering, NMT
7. Sean Standiford, Chemical Engineering, NMT
8. Zane Arias‡, Chemistry, NMT (Senior Thesis)
9. Sarah Bockisch‡, Chemistry, NMT (Senior Thesis)
10. Shaylen Paul‡, Environmental Science, Navajo Technical University (NM EPSCoR – STEMAP)
11. Matthew Devonport‡, Chemical Engineering, NMT – PhD student at University of Texas

‡ Supported financially – for research contributions not associated with academic credit.

PEER-REVIEWED PUBLICATIONS

NMT

Published

1. Hettiarachchi, E.; Reynolds, R.; Goldstein, H.; Moskowitz, B.; **Rubasinghege, G.*** Bioavailable Iron Production in Airborne Mineral-Dust: Controls by Chemical Composition and Solar Flux. *Atmospheric Environment*, **2019**, 205, 90-102.

2. Hettiarachchi, E.; Paul, S.; Cadol, D.; Frey, B.; **Rubasinghege, G.*** Mineralogy Driven Dissolution of Inhaled Uranium in Simulated Lung Fluids (SLFs) and Possible Toxic Effects, *Environmental Science and Technology Letters*, **2018**, 6, 62-67.

3. Thapa, S.; Hettiarachchi, E.; Dickie, D.; **Rubasinghege, G.;*** Qin, Y.* A Charge-separated Diamondoid Metal-organic Framework. *Chemical Communications*, **2018**, 54, 12654-12657.

4. Maldonado-Torres, S.; Gurung, R.; Rijal, H.; Chan, A.; Acharya, S.; Rogelj, S.; Piyasena, M.; **Rubasinghege, G.*** Fate, Transformation, and Toxicological Impacts of Pharmaceutical and Personal Care Products in Surface Waters. *Environmental Health Insights*, **2018**, 12(1-4).

5. Hettiarachchi, E.; Reynolds, R.; Goldstein, H.; Moskowitz, B.; **Rubasinghege, G.*** Iron Dissolution and Speciation in Atmospheric Aerosol: Synergistic and Antagonistic Effects of Externally-mixed Mineral Oxides. *Atmospheric Environment*, **2018**, 187, 417-423.
6. Hettiarachchi, E.; Hurub, O; **Rubasinghege, G.*** Atmospheric Processing and Iron Mobilization of Ilmenite: An Iron Containing Ternary Oxide in Mineral Dust Aerosol. *Journal of Physical Chemistry A*, **2018**, 122 (5), 1291-1302.
7. **Rubasinghege, G.***; Gurung, R.; Rijal, H.; Maldonado-Torres, S.; Chan, A.; Acharya, S.; Rogelj, S.; Piyasena, M. Abiotic Degradation and Environmental Toxicity of Ibuprofen: Roles of Mineral Particles and Solar Radiation*, Water Research*, Volume 131, **2017**, 22-32.

Under Review

8. Ellepola, N.; Ogas, T.; Turner, D.; Maldonado-Torres, S.; Gurung, R.; Tello-Arburto, R.; Patidar, P.; Rogelj, S.; Piyasena, M.; **Rubasinghege, G.*** A Toxicological Study on Photo-degradation Products of Environmental Ibuprofen: Ecological and Human Health Implications. *Ecotoxicology and Environmental Safety*, **2019**, Under Review.
9. Hettiarachchi, E.; **Rubasinghege, G.*** Mechanistic Study on Iron Solubility in Atmospheric Mineral Dust Aerosol: Roles of Titanium Metal, Acid Anions, and Dissolved Oxygen. *Environmental Science and Technology*, **2019**, Under Review.

In Preparation

10. Thapa, S.; Hettiarachchi, E.; Dickie, D. A.; **Rubasinghege, G.**;* Qin, Y.;* Li, R. A Charge-Separated Metal-Organic Framework for Selective Gas Adsorption and Ion Exchange Applications, *Chemical Communications*, **2019,** In Preparation.
11. Hettiarachchi, E.; Ivanov, S.;* **Rubasinghege, G.*** Novel Method for Synthesis of Nano-Ilmenite. *Journal of Applied Nanomaterials*, **2019**, In Preparation.
12. Hettiarachchi, E.; Ivanov., S.; Kieft., T.L.; Reynolds, R. L.; Goldstein, H. L.; Moskowitz, B.; **Rubasinghege, G.*** Mineralogy Driven Atmospheric Processing of Mineral Dust Aerosol and their Impact on the Growth of Marine Diatom: *Cyclotella meneghiniana*. *Environmental Science and Technology*, **2019**, In Preparation.
13. Troyer, M.; Huang, F.Y.C.;* Chowdhury, S.; Manajavcas, A.; Gieri, P.; **Rubasinghege, G.**; Solar Direct Contact Membrane Distillation Enabled by Photo-thermal Nanoparticles, *AIChE Journal*, **2019**, In preparation.

Non-NMT

14. Borcherding, J.; Baltrusaitis, B.; Chen, H.; Stebounova, L. ; Wu, C-M.; **Rubansinghege, G.** ; Mudunkotuwa, I. ; Caraballo, J. ; Zabner, J. ; Grassian, V. H. ; Comellas, A.* Iron Oxide Nanoparticles Induce Pseudomonas Aeruginosa Growth, Biofilm Formation, and Inhibit Antimicrobial Peptide Function. *Environmental Science: Nano*, **2014**, 1, 123-132.
15. Nanayakkara C. E.; Jayaweera P. M.; **Rubasinghege G.**; Baltrusaitis J.; Grassian, V.H.* Surface Photochemistry of Adsorbed Nitrate: The Role of Adsorbed Water in the Formation of Reduced Nitrogen Species on α-Fe2O3 Particle Surfaces. *Journal of Physical Chemistry A*, **2014**, 118, 158–166.
16. **Rubasinghege G.**; Ogden S.; Grassian, V.H.* Heterogeneous Uptake and Adsorption of Gas-Phase Formic Acid on Oxide and Clay Particle Surfaces: The Roles of Surface Hydroxyl Groups and Adsorbed Water in Formic Acid Adsorption and the Impact of Formic Acid Adsorption on Water Uptake. *Journal of Physical Chemistry A*, **2013**, 117, 11316–11327.
17. **Rubasinghege G.** and Grassian, V.H.* Role(s) of Adsorbed Water in the Chemistry of Environmental Interfaces. *Chemical Communication*, **2013**, 49, 3071-3094.

18. Baltrusaitis, J.; Chen, H.; **Rubasinghege G.**; Grassian, V.H.* Heterogeneous Chemistry of Lead Oxide Particles with Gas-phase Nitrogen Dioxide Increases Lead Solubility: Environmental and Health Implications. *Environmental Science and Technology*, **2012**, 46, 12806-13813.
19. Walker, R. A.; Wilson, K.; Lee, A. F.; Woodford, J.; Grassian, V. H.; Baltrusaitis, J.; **Rubasinghege, G.**; Cibin, G. and Dent, A.* *Scientific Reports*, **2012**, 2.
20. **Rubasinghege, G.**; Kyei, P.; Scherer, M.; Grassian, V.* Proton-promoted Dissolution of alpha-FeOOH Nanorods and Microrods: Size Dependence, Anion Effects (carbonate and phosphate), Aggregation and Surface Adsorption. *Journal of Colloid and Interface Science*, **2012**, 385, 15-23.
21. **Rubasinghege, G.**; Grassian, V. H.* Surface-catalyzed Chlorine and Nitrogen Activation: Mechanisms for the Heterogeneous Formation of ClNO, NO, NO_2, HONO and N_2O from HNO_3 and HCl on Alumina. *Journal of Physical Chemistry A*, **2012**, 116, 5180-5192.
22. Wijenayaka, L.; **Rubasinghege, G.**; Baltrusaitis, J; Grassian, V.H.* Surface Chemistry Of alpha-FeOOH Nanorods and Microrods with Gas-Phase Nitric Acid and Water Vapor: Insights into the Role of Particle Size, Surface Structure and Surface Hydroxyl Groups in the Adsorption and Reactivity of alpha-FeOOH With Atmospheric Gases. *Journal of Physical Chemistry C*, **2012**, 116, 12566–12577.
23. **Rubasinghege, G.;** Spak, S.; Stanier, C. O.; Carmichael, G. R.; Grassian, V. H.* An Abiotic Mechanism for the Formation of Atmospheric Nitrous Oxide from Ammonium Nitrate. *Environmental Science and Technology,* **2011**, 45, 2691-2697.
24. **Rubasinghege, G.**; Elzey, S.; Baltrusaitis, J.; Jayaweera. P. M.; Grassian, V. H.* Reactions on Atmospheric Dusts: New Mechanisms and Pathways Identified in Laboratory Studies-Surface Photochemistry and Size-dependent Nanoscale Redox Chemistry. *The Journal of Physical Chemistry Letters*, **2010**, 1, 1729–1737.
25. **Rubasinghege, G.**; Lentz, R. W.; Scherer, M. M.; Grassian, V. H.* Simulated Atmospheric Processing of Iron Oxyhydroxide Minerals at Low pH: Roles of Particle Size and Acid Anion in Iron Dissolution. Proceedings of the National Academy of *Sciences*, **2010**, 107, 15 6628-6633.
26. **Rubasinghege, G.**; Lentz, R. W.; Park, H.; Scherer, M. M.; Grassian, V. H.* Nanorod Dissolution Quenched in the Aggregated State. *Langmuir,* **2010**, 26, 1524-1527.
27. **Rubasinghege, G.**; Grassian, V. H.* Photochemistry of Adsorbed Nitrate on Aluminum Oxide Particle Surfaces. *Journal of Physical Chemistry C,* 2009, 113, 7818-7825.
28. Schuttlefield, J.; **Rubasinghege, G.**; El-Maazawi, M.; Bone, J.; Grassian, V. H.* Photochemistry of Adsorbed Nitrate. *Journal of the American Chemical Society*, **2008**, 130, 12210-12212.

SELECTED PRESENTATIONS

Invited

1. "Dust, Health and Climate: Roles of Surface Chemistry and Heterogeneous Processes in Environmental Processes" – Dept. of Chemistry and Chemical Biology, University of New Mexico, Albuquerque, NM – August 30th, 2019.
2. "Surface Chemistry of Airborne Mineral Dust Aerosols: Environmental and Health Implications" - 258th American Chemical Society (ACS) National Meeting, San Diego, CA – August 25th to 28th, 2019.
3. "Fate of pharmaceuticals in Wastewater: Roles of Environmental Factors and Toxicological Implications" - 258th American Chemical Society (ACS) National Meeting, San Diego, CA – August 25th to 28th, 2019.

4. *"*Stability and Biological Activities of Pharmaceuticals and Personal Care Products in Open Water Bodies: Roles of Environmental Factors*"* –256th American Chemical Society (ACS) National Meeting, Boston, MA – August 19th to 23rd, 2018.
5. *"*Atmospheric Feed of Bioavailable Iron to Ocean Life: Processing of Ion Containing Mineral Dust under low pH Atmospheric Conditions*"* – Dept. of Chemistry, University of Kelaniya, Sri Lanka – June 16th, 2016.
6. *"*Atmospheric Feed Bioavailable Iron to Ocean Life: Processing of Iron Containing Mineral Dust under Low pH Atmospheric Conditions*"* – Dept. of Earth and Environmental Science, New Mexico Tech, NM – November 19th, 2015.

Talks at International Meetings

7. "Abiotic Degradation and Toxicological Impacts of Pharmaceuticals and Personal Care Products (PPCPs) in Surface Waters: Roles of Mineral Sediments and Solar Radiation" – 50th American Geophysical Union (AGU) National meeting, New Orleans, LA – December 11th to 15th, 2017.
8. "Atmospheric Processing of Iron-Containing Mineral Dust Aerosol: A Major Source of Bioavailable Iron to Ocean Life" – 48th American Geophysical Union (AGU) National meeting, San Francisco, CA – December 12th to 16th, 2015.

Posters at International Meetings

9. "Toxicological Impacts of Pharmaceuticals and Personal Care Products on Water Quality: Environmental Fate, Transformation and Health Effects" – 49th American Geophysical Union (AGU) National Fall meeting, San Francisco, CA – December 12th to 16th, 2016.
10. "Toxicological Implications of Pharmaceuticals and Personal Care Products on Aquatic Life and Human Health: Roles of Soil Particles and Solar Flux in PPCP Degradation in Open Water Bodies" – Society for Environmental Toxicology and Chemistry (SETAC), Orlando, FL – November 26th, 2016.
11. "Linking Biological Activity of Ocean Diatoms to Atmospheric Processing of Fe-containing Minerals: Molecular Level Insights" - Gordon Research Conference-Atmospheric Chemistry, Waterville Valley, NH – August 2nd to 7th, 2015.

Presentations at Regional Meetings

12. "Fate, Transformation and Toxicological Impacts of Pharmaceuticals and Personal Care Products in Surface Waters" – NM-INBRE Conference, Albuquerque, NM. August 2018 – Talk.
13. "Abiotic Degradation and Environmental Toxicity of Selected Pharmaceutical and Personal Care Products: Roles of Mineral Particles and Solar Flux" – Regional Alliance of INBRE Networks, Big Sky, MT. June 2017 – 3-minute rapid-fire presentation.
14. "Abiotic Degradation and Environmental Toxicity of Selected Pharmaceutical and Personal Care Products: Roles of Mineral Particles and Solar Flux" – NM-INBRE Conference, Santa Fe, NM. April 2016 – Talk.
15. "Environmental Fate, Transformation and Long-term Health Effects of Pharmaceutical and Personal Care Products (PPCPs)" – NM-INBRE Conference, Santa Fe, NM. April 2015 – Poster.

FUNDING

Active Grants

1. "Degradation of PPCPs in Aquatic Systems: Ecotoxicological and Human Health Effects," New Mexico IDeA Network of Biomedical Research Excellence (INBRE) "FULL" project award, National Institutes of Health (NIH) grant P20GM103451, 2019–2021 (renew yearly, contingent on progress), Director: Shelly Lusetti, Principal investigator (PI): Gayan Rubasinghege, FULL project total over 2 years: $193,788.

   Awarded following competitive evaluation of a proposal submitted in Oct 2018. Supports two full-time graduate students with summer and partial academic year funding (usually 1 semester), and two undergraduate research assistants.

2. "Arctic River-Delta-Coastal Chemistry in the DOE Hierarchy of Models," Los Alamos National Laboratories (LANL), sub award, Department of Energy (DOE) grant, RFP: 547055, 2019-2022. LANL PI: Scott Elliott, NMT PI: Gayan Rubasinghege, project total over 3 years: $73,877.

   Supports a full-time graduate student for fall and summer semesters for three years.

3. "Linking Biological Activity of Ocean Diatoms to Atmospheric Processing of Fe-containing Nanoparticles: Molecular Level Insights", Center for Integrated Nanotechnologies (CINT), user proposal, 2017-2020. CINT PI: Sergei Ivanov, Project PI: Gayan Rubasinghege.

   Provides state-of-the-art research facilities and guidance for the synthesis of nanomaterials. Two graduate students work with Dr. Ivanov at CINT, two days a week, on material synthesis and characterization.

Completed Grants

1. "Fate, Transformation and Toxicological Impacts of PPCPs," New Mexico IDeA Network of Biomedical Research Excellence (INBRE) "FULL" project award, National Institutes of Health (NIH) grant P20GM103451, 2016–2019 (renewed twice), Director: Arterburn/Lusetti, Principal investigator (PI): Rubasinghege, FULL project total over 3 years: $312, 924.
2. "Toxicological Impacts of "Mineral Aging" on Human Health in the Presence of PPCPs," New Mexico IDeA Network of Biomedical Research Excellence (INBRE) "FOCUS" project award, National Institutes of Health (NIH) grant P20GM103451, 2015–2016, Director: Arterburn/Lusetti, Principal investigator (PI): Rubasinghege, FOCUS project total over 1 year: $37, 525.

Pending Grants

1. "Environmental Fate, Transformation and Long-term Health Effects of Pharmaceuticals and Personal Care Products," National Institute of Environmental Health Science (NIEHS) under National Institutes of Health (NIH), R15 grant mechanism, 2019–2022, PI: Rubasinghege, expected project total over 3 years: $385k.
2. "A Laboratory Study to Investigate the Effects of non-Fe Bearing Mineralogy on Bioavailable Fe Production in Mineral Dust Aerosol," Division of Atmospheric and Geospace Science (AGS) under National Science Foundation (NSF), 2019–2022, PI: Rubasinghege, expected project total over 3 year: $338k.
3. "Regenerative Resource Design - Graduate Education for Resilient Solutions to 21st Century Environmental Problems," Division of Graduate Education (DGE) under National Science Foundation (NSF), NRT grant mechanism, 2020–2025, Principal investigator (PI): Duval (Biology, NMT), Co-PI: Rubasinghege, expected project total over 3 year: $2.6M.

JOURNAL REVIEWING

1. Environmental Science & Technology
2. Environmental Science & Technology Letters
3. The Journal of Physical Chemistry A
4. Atmospheric Chemistry and Physics
5. The Journal of Physical Chemistry
6. Atmosphere
7. The Chemical Educator
8. Water Research
9. Environmental Science Process Impacts
10. Water
11. Atmospheric Environment
12. International Journal of Environmental Research and Public Health
13. Scientific Reports

COMMITTEE SERVED

1. Member – Environmental Science Curriculum Committee (2015 – to date)
2. Member - Academic Standards and Admission committee (2019 – 2021)
3. Chair – Chemistry Teaching and Hiring Committee (2016-2019)
4. Chair – Chemistry IT Committee (2017-2019)
5. Member – Chemistry Graduate Progress Committee (2015-2019)
6. Member – Chemistry Instrumentation Committee (2015 – to date)

GRADUATE STUDENT COMMITTEE (Current and served)

Current:

1. Eshani Hettiarachchi (**PhD, Research and Academic Advisor**)
2. Nishanthi Ellepola (**PhD, Research and Academic Advisor**)
3. Milton Das (**PhD, Research and Academic Advisor**)
4. Amadini Jayasinghe (**PhD, Research Co-advisor and Academic Advisor**)
5. Shahriare Hossain (PhD , Committee member)
6. Susantha Ganegamage (PhD, Committee member)
7. Dumindu Premachandra (PhD, Committee member)

Served:

8. Hom Nath Rijal (MS, Academic and Research Advisor)
9. Rubi Gurung (PhD, Chemistry, Committee member)
10. Samantha Bixler (MS, Civil and Environmental Engineering, Committee member)
11. Sonagnon Dabli (MS, Civil and Environmental Engineering, Committee member)