

Md. Shafiul Azam, Ph.D.

Assistant Professor, Department of Chemistry
Bangladesh U. of Engineering & Technology (BUET), Dhaka – 1000, Bangladesh
E-mail: mdshafiulazam@chem.buet.ac.bd, azam@ualberta.ca • Phone: +8801535495622

CURRENT POSITIONS

Bangladesh University of Engineering & Technology Dhaka, Bangladesh
Assistant Professor, Department of Chemistry 2014 - present

ADJUNCT POSITIONS

OMICS International Henderson NV, USA
Editorial Board Member, Journal of Industrial Engineering & Management 2017 - present

Borderless Science Publishing Ontario, Canada
Editorial Board Member, Canadian Chemical Transactions 2013 - present

EDUCATION

University of Alberta Edmonton AB, Canada
Ph.D., Chemistry 2008 - 2013
Dissertation: Surface Spectroscopic Studies of Molecular Recognition on Silica

Bangladesh University of Engineering & Technology Dhaka, Bangladesh
M.Phil., Chemistry 2005 - 2008
Dissertation: Synthesis of Catalytically Important Manganese Oxide Nanoparticles and their dispersion into a Polymeric Matrix

Jahangirnagar University Dhaka, Bangladesh
B.Sc. and M.Sc., Chemistry 1999 - 2004

GRANTS AND AWARDS

- Research Grant from the Ministry of Science and Technology, Government of the Peoples Republic of Bangladesh, Bangladesh, 2017-2018 (Grant Value BDT 300,000.00)
Project Title: Developing a bio-inspired strategy for the immobilization of silver nanoparticles toward the synthesis of antimicrobial paper

- Research Grant from the Ministry of Science and Technology, Government of the Peoples Republic of Bangladesh, Bangladesh, 2016- 2017 (Grant Value BDT 500,000.00)
Project Title: Fabrication of graphene crosslinked biopolymer for biodegradable food packaging
- The World Academy of Science (TWAS) Research Grant (Individual), 2015 (Grant value USD 19,357.00)
Project Title: A bioinspired approach to synthesizing thermo-sensitive and magnetically responsive hydrogel composites
- Committee for Advanced Studies and Research (CASR) grant from BUET, 2014 (Grant value BDT 523,000.00)
Project Title: *N*-Halamine functionalization of polydopamine coated magnetic nanoparticles to generate recyclable antibacterial materials
- Dr. R. Norman and Magda Kemeny Jones Award, *University of Alberta*, 2011
- Graduate Student Association Professional Development Award, *University of Alberta*, 2011
- Teaching Assistantship Prizes, *Department of Chemistry, University of Alberta*, 'Happy Students Category' – 2009, 'Highest Rating Category' - 2013
- Jahangirnagar University Chemists Alumni Forum Award, *Jahangirnagar University*, 2001 and 2002
- University Merit Scholarship, *Jahangirnagar University*, 2000 – 2004

PROFESSIONAL EXPERIENCE

Bangladesh University of Engineering & Technology

Dhaka, Bangladesh

Assistant Professor, Department of Chemistry

2014 - present

Research Focus: Multifunctional Materials and Surfaces; Polymers

- Work as principal investigator of several projects locally and internationally funded; supervise graduate students on their individual research projects
- Plan and design various projects based on materials and surface chemistry
- Participate in setting goals and objectives of the department as well as plan the strategies for achieving the goals
- Lecture to the class of undergrad and grad students; instruct general and environmental chemistry courses; set question papers, grade problem sets and exams

OMICS International

Henderson NV, USA

Editorial Board, Journal of Industrial Engineering & Management

2017 - present

- Handle responsibilities of developing style guidelines for authors, use of journals in

teaching and solicitation requests from authors

- Provide guidelines to authors to achieve clarity and in improving the overall quality

Borderless Science Publishing

Ontario, Canada

Editorial Board, Canadian Chemical Transactions

2013 - present

- Conduct initial screening of manuscripts and forward those that meet the criteria
- Handle responsibilities of revising manuscripts based on reviewer comments with the author
- Coordinate with the editorial board to provide overall strategic direction of the journal

University of Alberta

Edmonton AB, Canada

Visiting Research Professor, Department of Chemistry

2014 – 2015 (3 months)

Research Focus: Nanomaterials, nonlinear optical (NLO) spectroscopy

- Performed research as an exchange professor and mentored grad students on their individual projects
- Conducted collaborative research projects involving the department of chemistry at BUET and department of chemicals and materials engineering at UAlberta

Canadian Centre for Clean Coal/Carbon & Mineral Processing Technologies

Canada

Postdoctoral Research Fellow

2013 - 2014

Research Focus: Multifunctional materials; NLO spectroscopy

Advisor: Prof. Qingxia Liu, Prof. Hongbo Zeng and Prof. Julianne Gibbs-Davis

- Mentored graduate and undergraduate students; write and review monthly reports, research articles and experimental data
- Designed and synthesized advanced functional nanomaterials with novel engineering applications and conduct research on improving their surface properties
- Investigated the thermodynamic stability of different species in recycled/saline water at variable pH and temperature

University of Alberta

Edmonton AB, Canada

Research/Teaching Assistant, Department of Chemistry

2008 - 2013

Research Focus: Molecular recognition at the interface; NLO spectroscopy

Advisor: Prof. Julianne Gibbs-Davis

- Managed research projects towards the synthesis and investigation of numerous environmentally and bio- relevant functional materials; published 5 first-authored and 1 co-authored journal publications
- Assisted in the set up of a new research laboratory, aided research supervisor in planning and developing numerous long term research projects

- Mentored 1 graduate and 3 undergraduate research students on their individual projects; trained many junior researchers on various techniques
- Assisted the 'Environmental Analytical Chemistry' class of 120 students with problem sets or class materials; conducted lab classes and evaluated lab performances

Bangladesh University of Engineering & Technology

Dhaka, Bangladesh

M.Phil. Researcher & Lecturer, Department of Chemistry

2005 - 2008

Research Focus: Synthesis and application of functional polymers and nanomaterials

Advisor: Prof. Al-Nakib Chowdhury

- Developed cost-effective polymer composite materials and monitored their effects on remediation of industrial wastewater
- Explored the application of manganese oxide and cobalt-nickel mixed oxide as promising materials for the removal of industrial dye from wastewater
- Lectured to class of around 50 undergrad students; instructed general and physical chemistry courses; set question papers, graded problem sets and examinations

Jahangirnagar University

Dhaka, Bangladesh

Graduate Researcher, Department of Chemistry

2003 - 2004

Research Focus: Drug-polymer interaction, adsorption of heavy metal ions

Advisor: Prof. Farida Akhtar

- Investigated polymer-ligand composites for drug delivery applications, interpreted the noncovalent binding of organic molecules to the polymers in water
- Explored the potential use of chitosan polymer in a cost-effective adsorption filtration system for the removal of heavy metals from aqueous solutions

PUBLICATIONS**Book Chapter**

- Invited book chapter**, titled "*Biochars and Biochar Composites: Low Cost Adsorbents for Environmental Remediation*", Rizwan Tareq, Nahida Akter, Md. Shafiul Azam, **Biochar from Biomass**, Elsevier Publishers, Edited by: Prof. Yong Sik Ok, **2018**, *submitted (with editor)*.

Peer-Reviewed Journal Publications

- Akter, N.; Chowdhury, L.; Ullah, A.K.M.A.; Shariare M.H.; Azam, M.S. "*N-Halamine Functionalization of Polydopamine Coated Fe₃O₄ Nanoparticles for Recyclable and Magnetically Separable Antimicrobial Materials*," *ChemistrySelect*, **2018**, submitted.

- ii. Islam, M.S.; Akter, N.; Rahman, M. M.; Shi, C.; Islam, M. T.; Zeng, H.; Azam, M. S. "Mussel-Inspired Immobilization of Silver Nanoparticles toward Antibacterial Cellulose Paper," *ACS Sustainable Chemistry & Engineering*, **2018**, in press. [Impact Factor = 5.95]
- iii. Islam, M. R.; Osama, H. M.; Zubair, M. A.; Azam, M. S.; Sharif, A. "Evidence of Superparamagnetism and Improved Electrical Properties in Ba and Ta Co-doped BiFeO₃ Ceramics," *J. Alloys and Compounds*, **2018**, 735, 2584-2596. [Impact Factor = 3.13]
- iv. Darlington, A.; Jarisz, T.; Dewalt-Kerian, E.; Roy, S.; Kim, S.; Azam, M.S.; Hore, D.; Gibbs, J.M. "Separating the pH-Dependent Behavior of Water in the Stern and Diffuse Layers with Varying Salt Concentration," *J. Physical Chemistry C*, **2017**, 121, 20229-20241. [Impact Factor = 4.54]
- v. DeWalt-Kerian, E. L.; Kim, S.; Azam, M.S.; Zeng, H.; Liu, Q.; Gibbs, J.M. "pH-Dependent Inversion of Hofmeister Trends in the Water Structure of the Electrical Double Layer," *J. Physical Chemistry Letter*, **2017**, 8, 2855-2861. [Impact Factor = 9.35]
- vi. Islam, M.R.; Rashid A.K.M.B.; Ferdous M.; Azam M.S., "Effects of Heating Time on the Growth and Behavior of Amorphous Carbon Nanostructures from Ferrocene," *Materials Research Express*, **2017**, 4, 055601 [Impact Factor = 1.07]
- vii. Hoque, M. I.; Chowdhury, D. A.; Holze, R.; Chowdhury, A. N.; Azam, M. S. "Modification of Amberlite XAD-4 Resin with 1,8-Diaminonaphthalene for solid Phase Extraction of Copper, Cadmium and Lead and its Application to Determination of these Metals in Dairy Cow's Milk," *J. Environmental Chemical Engineering*, **2015**, 3 (2), 831-842. [Impact Factor = 1.36]
- viii. Li, Z.;[†] Weeraman, C. N.;[†] Azam, M. S.; Osman, E.; Gibbs-Davis, J. M. "The Thermal Reorganization of DNA Immobilized at the Silica/Buffer Interface: A Vibrational Sum Frequency Generation Investigation," *Physical Chemistry Chemical Physics*, **2015**, 17 (19), 12452 - 12457. ([†]joint first-authors). [Impact Factor = 4.12]
- ix. Zhang, J.; Azam, M. S.; Shi, C.; Huang, J.; Yan, B.; Liu, Q.; Zeng, H. "Poly(acrylic acid) Functionalized Magnetic Graphene Oxide Nanocomposite for Removal of Methylene Blue," *RSC Advances*, **2015**, 5 (41), 32272 - 32282. [Impact Factor = 3.11]
- x. Azam, M. S.; Darlington, A.; Gibbs-Davis, J. M. "Influence of Concentration on Specific Ion Effects at the Silica/Water Interface," *J. Physics: Condensed Matter*, **2014**, 26, 244107. (Special Issue). [Impact Factor = 2.65]
- xi. Azam, M. S.; Gibbs-Davis, J. M. "Monitoring DNA Hybridization and Thermal Dissociation at the Silica/Water Interface Using Resonantly Enhanced Second Harmonic Generation Spectroscopy," *Analytical Chemistry*, **2013**, 85 (17), 8031 - 8038. (Editors' Highlight). [Impact Factor = 6.32]

- xii. Azam, M. S.; Weeraman, C. N.; Gibbs-Davis, J. M. "Halide-Induced Cooperative Acid-Base Behavior of the Silica/Water Interface," *J. Physical Chemistry C*, **2013**, 117, 8840 - 8850. [Impact Factor = 4.54]
- xiii. Azam, M. S.; Weeraman, C. N.; Gibbs-Davis, J. M. "Specific Cation Effects on the Bimodal Acid-Base Behavior of the Silica/Water Interface," *J. Physical Chemistry Letters*, **2012**, 3, 1269 - 1274. [Impact Factor = 9.35]
- xiv. Azam, M. S.; Fenwick, S. L.; Gibbs-Davis, J. M. "Orthogonally Reactive SAMs as a General Platform for Bifunctional Silica Surfaces," *Langmuir*, **2011**, 27 (2), 741 - 750. [Impact Factor = 3.83]
- xv. Chowdhury, A-N; Rahim A.; Ferdousi, Y. J.; Azam, M. S.; Hossain, M. M. "Cobalt-Nickel Mixed Oxide Surface: A Promising Adsorbent for the Removal of PR Dye from Water," *Applied Surface Science*, **2010**, 256, 3718-3724. [Impact Factor = 3.39]
- xvi. Chowdhury, A.-N.; Azam, M. S.; Aktaruzzaman, M.; Rahim, A. "Oxidative and Antibacterial Activity of Mn₃O₄," *J. Hazardous Materials*, **2009**, 172, 1229 - 1235. [Impact Factor = 6.07]
- xvii. Rana, M. S.; Halim, M. A.; Safiullah, S.; Mollah, M. M.; Azam, M. S.; Goni, M. A.; Hossain, M. K.; Rana, M. M. "Removal of Heavy Metal from Contaminated Water by Biopolymer Crab Shell Chitosen," *J. Applied Science*, **2009**, 9 (15), 2762 - 2769. [Impact Factor = 1.77]
- xviii. Akhtar, F.; Azam, M. S.; Hoque, M. A. "Interaction of Polyethylene Glycol with Hydroxybenzoic Acids and Derivatives: Thermodynamics of the Binding Equilibria and Interaction Forces," *J. Bangladesh Chemical Society*, **2008**, 21(2), 149-154.
- xix. Chowdhury, A.-N.; Islam, M. S.; Azam, M. S. "Polyaniline Matrix Containing Nickel Ferromagnet," *J. Applied Polymer Science*, **2007**, 103, 321 - 327. [Impact Factor = 1.86]
- xx. Akhtar F.; Azam, M. S. "Interaction of povidone with Hydroxybenzoic Acids and Acetylsalicylic Acid: Thermodynamics of the Binding Equilibria and Interaction Forces," *J. Bangladesh Chemical Society*, **2005**, 18(2), 134-141

Conference Proceedings & Extended Abstracts

- i. Azam, M.S. and Islam, M.S. "A Bioinspired Strategy for Immobilizing Silver Nanoparticles towards the Synthesis of Antibacterial Paper," *Research and Review: J Material Sciences*, 2017
- ii. Azam, M. S.; Weeraman, C. N.; Gibbs-Davis, J. M. "Monitoring the Behavior of DNA at the Silica/Water Interface Using Nonlinear Optical Spectroscopy," *Abstract Book of 16th Asian Chemical Congress*, 2015.
- iii. Azam, M.S. and Islam, M.S., *Mussel-Inspired Synthesis of Antibacterial Paper Based on Silver Nanoparticles*, *Abstract Book of 16th Asian Chemical Congress*, 2015.

- iv. Sultana, S.; Bushra, L.; Azam, M. S. "Multiresponsive Hydrogel: A Strategy of Combining Magneto- and Thermo- Responsiveness into a Single Nanocomposite Hydrogel," Abstract Book of 16th Asian Chemical Congress, 2015.
- v. Bushra, L.; Sultana, S.; Azam, M. S. "Multiresponsive Hydrogel: A Strategy of Combining Magneto- and pH- Responsiveness into a Single Nanocomposite Hydrogel," Abstract Book of 16th Asian Chemical Congress 2015.
- vi. Azam, M. S.; Weeraman, C. N.; Gibbs-Davis, J. M. "Ion specific acid-base equilibria of the silica/water interface studied by second harmonic generation spectroscopy," Abstracts of Papers of the American Chemical Society 244, 2012.
- vii. Gibbs-Davis, J. M.; Azam, M. S. "Quantifying the influence of confinement on the behavior of DNA immobilized at the silica-water interface using second harmonic generation," Abstracts of Papers of the American Chemical Society 244, 2012.
- viii. Azam, M. S.; Weeraman, C. N.; Gibbs-Davis, J. M. "Monitoring the silica and functionalized silica-aqueous interface using second harmonic generation spectroscopy," Abstracts of Papers of the American Chemical Society 244, 2012.
- ix. Azam, M. S.; Gibbs-Davis, J. M., Studying hybridization and melting of immobilized DNA at the silica-water interface using sum frequency generation spectroscopy, CN Weeraman, Abstracts of Papers of the American Chemical Society 244, 2012.
- x. MS Azam, CN Weeraman, JM Gibbs-Davis, Second harmonic generation spectroscopy study of halide partitioning at the silica/water interface, Abstracts of Papers of the American Chemical Society 243, 2012.
- xi. Azam, M. S.; Weeraman, C. N.; Gibbs-Davis, J. M. "Halide specific effects on the acid-base equilibria of the silica/water interface studied by second harmonic generation spectroscopy," Abstracts of Papers of the American Chemical Society 243, 2012.
- xii. Gibbs-Davis, J. M.; Azam, M. S.; Weeraman, C. N. "Monitoring specific ion effects on acid-base equilibria of the silica/water interface with second harmonic generation spectroscopy," Abstracts of Papers of the American Chemical Society 243, 2012.
- xiii. Gibbs-Davis, J. M.; Azam, M. S. "Halide specific effects on the acid-base equilibria of the silica/water interface studied by second harmonic generation spectroscopy," Abstracts of Papers of the American Chemical Society 241, 2011.
- xiv. Gibbs-Davis, J. M.; Azam, M. S. "Orthogonally reactive SAMs as a general route to bifunctional surfaces," Abstracts of Papers of the American Chemical Society 241, 2011.

Presentations

- i. Azam, M.S. and Islam, M.S. "A Bioinspired Strategy for Immobilizing Silver Nanoparticles towards the Synthesis of Antibacterial Paper," 10th International Conference on Emerging Materials and Nanotechnology, Vancouver BC, Canada, July 27 – 29, 2017.
- ii. Azam, M. S.; Weeraman, C. N.; Gibbs-Davis, J. M. "Monitoring the Behavior of DNA at the Silica/Water Interface Using NLO Spectroscopy" 16th Asian Chemical Congress, Dhaka, Bangladesh, March 16 - 19, 2016. (oral presentation)
- iii. Azam, M. S. "Molecular Recognition at the Interfaces: From Nano to Sub-Nano Scale," Seminar on Advances of Nanosciences in Bangladesh, *HEQEP of UGCB at Maulana Bhashani Science and Technology University, Tangail, Bangladesh*, Sep 17, 2014. (distinguished speaker)
- iv. Azam, M. S.; Gibbs-Davis, J. M. "Specific Ion Effects on Acid-Base Equilibria at the Planar Silica/Water Interface," *CECAM Workshop on Liquid/Solid Interfaces, CECAM-HQ-EPFL, Lausanne, Switzerland*, Jun 24 – 26, 2013. (invited presentation)
- v. Azam, M. S.; Fenwick, S. L.; Gibbs-Davis, J. M. "Orthogonally Reactive SAMs as a General Platform for Well-Defined Mixed Monolayers", *94th Canadian Chemistry Conference and Exhibition, Montreal QC, Canada*, Jun 05 – 09, 2011. (oral presentation)
- vi. Azam, M. S.; Fenwick, S. L.; Gibbs-Davis, J. M. "Mixed Monolayers of Azides and Amines: Exploiting Orthogonal Reactivity to Generate Bifunctional Surfaces", *4th Banff Symposium on Organic Chemistry (BSOC), Banff AB, Canada*, Oct 29 – Nov 01, 2009. (poster presentation)
- vii. Azam, M. S.; Gibbs-Davis, J. M. "Cooperativity Study in Interfacial Binding by Using Nonlinear Optical Spectroscopy", *4th Annual Chautauqua on Nonlinear Optics, Purdue University, West Lafayette IN, USA*, Jun 1 – 5, 2009. (oral presentation)

SHORT COURSE, TRAINING & WORKSHOP

- **'Establishing a World-class Museum in Bangladesh'**, *National Science & Technology Museum (attended as nominee, BUET)*, Jun 2015
- **'Teaching and Learning Session'**, *a workshop series run by Centre for Teaching and Learning, University of Alberta*, Sept 2012
- **'Radiation Safety Training Certification'**, *Environmental Health and Safety, University of Alberta*, May 2012
- **'Basic Fire Extinguisher Training Certification'**, *Spectrum Safety Services, Edmonton, AB*, May 2011

- **'Writing for Professional Success as a Researcher'**, a workshop series run by Heather Graves, Professor of English and Film Studies, University of Alberta, Feb 2012
- **'Graduate Ethics Training Course on Scientific Integrity and Conflict Resolution'**, Faculty of Graduate Studies and Research, University of Alberta, Nov 2010
- **'Professional Development Training Series'**, Faculty of Graduate Studies and Research, University of Alberta, Aug 2009
- **'Teachers' Appreciation Workshop'**, Directorate of Continuing Education, Bangladesh University of Engineering & Technology, Dhaka, Bangladesh, May 2008.
- **'Safety Training under WHMIS Regulations'**, University of Alberta, Sept 2008

LEADERSHIP EXPERIENCE

- **Assistant Provost**, Dr. M. A. Rashid Hall, BUET, 2015 – present
- **Convener**, ChemShow Committee, Bangladesh Chemistry Olympiad, Dhaka, Bangladesh, 2018
- **International Scientific Committee**, 2nd International Conference on Bioresources, Energy, Environment, and Materials Technology (BEEM), Gangwon-do, Korea, 2018
- **Member Secretary**, Registration and Invitation Sub-Committee, 16th Asian Chemical Congress, Dhaka, Bangladesh, 2016
- **Student Leader**, Emerging Leaders Program, University of Alberta, 2012 – 2013
- **Vice President**, Bangladeshi Student Association at University of Alberta, 2013
- **In-House Safety Inspector**, Department of Chemistry, University of Alberta, 2012
- **Council Member**, Science Faculty Council, University of Alberta, 2012 – 2013
- **Program Coordinator**, Parade of Nations, Michener Park, Edmonton, AB, 2012
- **Co-organizer**, Physical Chemistry Divisional Monthly Student Seminar Series, Department of Chemistry, University of Alberta, 2010 – 2011

PROFESSIONAL MEMBERSHIP

- Bangladesh Chemical Society (2005 - present), American Chemical Society (2009 - 2013), Canadian Society for Chemistry (2008 - 2014), Association of the Chemical Profession of Alberta (ACPA) (2013-2015), U of A Nanotechnology Group (2009 - present)