

Mohammad Shohel

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Educational History:

Doctor of Philosophy (2016-2021)

Institution : University of Iowa, Iowa, USA
Major : Chemistry

Masters of Science (2014-2016)

Institution : University of Dhaka, Dhaka, Bangladesh
Major : Inorganic and Analytical Chemistry
CGPA : 3.74/4.00

M.S. Thesis: *“Elemental Composition and their Sources Characterization in Dew Water Collected from Bhola Island, Bangladesh”*

Bachelor of Science (2010-2014)

Institution : University of Dhaka, Dhaka, Bangladesh
Major : Chemistry
CGPA : 3.47/4.00

Undergraduate Project Dissertation: *“Characterization of ZnO nanoparticles prepared by electrochemical-thermal method”*

Professional Experiences:

- 1) **Post-doctoral Scholar**, Actinide Center of Excellence (funded by NNSA), Department of Chemistry, Oregon State University (01/03/2022-present)
- 2) **Graduate Intern**, Storage & Transportation Technology, Sandia National Lab, Albuquerque, NM (9/14/2020-3/31/2021)
- 3) **Graduate Research Assistance**, Department of Chemistry, University of Iowa (2018-2021)
- 4) **Graduate Teaching Assistance**, Department of Chemistry, University of Iowa.
Course taught:
 - Principles of Chemistry-1 (Lab) (Spring-2017, Spring-2018, Fall-2018)
 - Principles of Chemistry-1 (Discussion) (Fall-2017)
- 5) **Graduate Research Assistance**, Department of Chemistry, University of Dhaka (2014-2015)

Honors and Awards:

- 1) Best Graduate Student Paper Award by the Great Lakes Section of the Society for Sedimentary Geology (GLS-SEPM), Geological Society of America: North-

- Central Section Meeting, 2018.
- 2) Graduate College Post-Comprehensive Examination Award, The University of Iowa, Spring 2019.
 - 3) Travel Grant from American Crystallographic Association to attend ACA summer course, 2019.
 - 4) University of Iowa Radio Chemistry Summer Fellowship, 2017.
 - 5) Travel Grant from Atmospheric Composition and the Asian Monsoon (ACAM) to attend 2nd ACAM international workshop, 2015.

Publication and Presented Work :

Peer-reviewed Publications

- 1) A. Lulich, M. Amiri, D. Stephen, M. Shohel, Z. Mao, M. Nyman, “Bismuth Coordination Polymers with Fluorinated Linkers: Aqueous Stability, Bivolatility, and Adsorptive Behavior”, *ACS Omega*, **2023**. (Just accepted)
- 2) A.W. Knight, J.A. Harvey, M. Shohel, P. Lu, D. Cummings, A. Ilgen, "The combined effects of Mg²⁺ and Sr²⁺ incorporation during CaCO₃ precipitation and crystal growth", *Geochimica et Cosmochimica acta*, 345: 16-33, **2023**.
- 3) M. Shohel, J.A. Smith, M.A. Carolan, T.Z. Forbes, “Thermal Aging of Heteroatom-Substituted Keggin-Type Aluminum Oxo Polycation Solutions: Aggregation Behavior and Impacts on Humic Acid and Turbidity Removal”, *Environmental Science & Technology: Water*, 2(1): 22-31, **2022**.
- 4) M. Shohel, K.K. Ray, A.V. Tivanski, N.E.B. McAdams, A.M. Bancroft, B.D. Cramer, T.Z. Forbes, “Nanomechanical variability in the early evolution of vertebrate dentition” *Scientific Reports*, 12(1): 1-8, **2022**.
- 5) M. Shohel, J.A. Smith, J.A. T.Z. Forbes, “Cr³⁺ incorporation into an Al³⁺ Keggin-type oligomer to form the Al_{25.7}Cr_{6.3}S₂₁⁶⁺ polycation” *Inorganic chemistry communications*, 141: 109519, **2022**.
- 6) M. Ullah, M.S. Islam, F. Akter, M. Shohel, M. Rokonujjaman, A. Salam, A. “Chemical composition and source apportionment of rainwater over Bangladesh during the monsoon” *International Journal of Environmental Science and Technology*, **2022** (just accepted)
- 7) M. Shohel, J.L. Bjorklund, J.A. Smith, S.E. Mason, T.Z. Forbes, “Formation of nanoscale [NaGe₄O₁₆Al₄₈(OH)₁₀₈(H₂O)₂₄]²¹⁺ from condensation of ε-GeAl₁₂⁸⁺ Keggin polycations”, *Angewandte Chemie International*, 60 (16): 8755-8759, **2021**.
- 8) J.L. Bjorklund*, M. Shohel*, J.A. Smith, M.A. Carolan, S.E. Mason, T.Z. Forbes, “Density Functional Theory and Thermodynamics Analysis of MA₁₂ Keggin Substitution Reactions: Insights into Ion Incorporation and Experimental Confirmation”, *The Journal of Chemical Physics*, 154(6): 064303, **2021**. *equal contribution
- 9) M. Shohel, N.E. McAdams, B.D. Cramer, T.Z. Forbes, “Ontogenetic variability in crystallography and mosaicity of conodont apatite: implications for microstructure, palaeothermometry and geochemistry” *Royal Society Open Science*, 7(7): 200322, **2020**.
- 10) M. Shohel, J.L. Bjorklund, E.A. Ovrom, S.E. Mason, T.Z. Forbes, “Ga³⁺ Incorporation into Al₁₃ Keggin Polyoxometalates and the Formation of δ-(GaAl₁₂)⁷⁺ and (Ga_{2.5}Al_{28.5})¹⁹⁺ Polycations” *Inorganic Chemistry*, 59(15): 10461-10472, **2020**.
- 11) T. Akther, M. Ahmed, M. Shohel, F. K. Ferdousi, A. Salam, “Particulate Matters and Gaseous Pollutants in Indoor Environment and Association of Ultrafine Particulate Matters (PM_{1.0}) with Lung Function” *Environmental Science and Pollution Research*, 26(6): 5475-5484, **2019**.

- 12) M. Ahmed, A. Hossain, T. Akther, M. Shohel, A. Salam, “Chemical Composition and Source Identification of Fog Water at an Indo-Gangetic Plain (IGP) Outflow Location (Coastal Bhola Island), Bangladesh” *Journal of Environmental Pollution and Management*, 1(1): 1, **2018**.
- 13) R.A. Samiha, M. Ahmed, M. Shohel, A. Salam, “Chemical Composition and Source Characterization of Hailstones in Dhaka, Bangladesh” *Journal of Geoscience and Environment Protection*, 6(9):71, **2018**.
- 14) M. Shohel, M. Kistler, M.A. Rahman, A. Kasper-Giebl, J.S. Reid, A. Salam, “Chemical Characterization of PM_{2.5} Collected from a Rural Coastal Island of the Bay of Bengal (Bhola), Bangladesh” *Environmental Science and Pollution Research*, 25: 4558, **2018**.
- 15) M. Shohel, A. Salam, J.S. Reid, E. Reid, H.A. Simol, “Dew water chemical characterization and source characterization in the IGP outflow location (coastal Bhola, Bangladesh)”, *Air Quality Atmosphere and Health*, 10: 981, **2017**.
- 16) M. Shohel, M.S. Miran, M.A.B.H. Susan, M.Y.A. Mollah, “Calcination temperature-dependent morphology of photocatalytic ZnO nanoparticles prepared by an electrochemical-thermal method”, *Research on Chemical Intermediates* 42: 5281, **2016**.

Manuscripts Under Review or in Preparation

- 1) M. Shohel, J. Bustos, M. Nyman, “Solid state structures towards understanding the role of An(IV)-TcO₄ connectivity in Tc mobility in nuclear fuel reprocessing and the environment” (In preparation)
- 2) J. Bustos, M. Shohel, C. Simon, M. Nyman “Formation pathway of Tc/Re paddlewheel dimer and chain compound coordinated with phenylphosphonic acid” (In preparation)
- 3) A. Blanes-Díaz, M. Shohel, N.T. Rice, J.A. Bertke, S.A. Kozimor, M. Nyman, K.E. Knope, “Synthesizing Ce cluster having varying nuclearity and coordination environment by using beta-diketonate ligand” (In preparation)
- 4) M. Shohel, R.M. Katona, A.W. Knight, C.R. Bryan, R.F. Schaller, T.Z. Forbes, “An in situ Raman spectroelectrochemical study to probe effect of MgCl₂ concentration and seasalt on Mg(OH)₂ formation during cathodic polarization of austenitic stainless steel (SS304)” (In preparation)
- 5) M. Shohel, J.L. Bjorklund, S.E. Mason, T.Z. Forbes, “Review on Keggin-type Polyaluminum Oxo Compound: Structure, Reactivity and Application” (In preparation)

Presented Work

- 1) M. Shohel, B.D. Cramer, and T. Z. Forbes “X-ray diffraction and Nanoindentation on conodont microfossils revealed variation of Mechano-structural properties along the length of conical elements” *GSA Annual Meeting*, Phoenix, Arizona, USA, 21-26 September, 2019
- 2) M. Shohel, B.D. Cramer, and T. Z. Forbes “Systematic assessment of crystalline structure along the length of conical conodont microfossils using microfocus X-ray diffraction” *GSA Annual Meeting*, Indianapolis, Indiana, USA, 6-7 November, 2018.
- 3) M. Shohel, B.D. Cramer, and T. Z. Forbes “Studying Crystalline Structure of Conodont Microfossils with X-ray Diffraction” *GSA North-Central Section Meeting*, Iowa State University, Ames, Iowa, USA, 16-17 April, 2018.
- 4) M. Shohel, M. Ullah, F. Akter, A. Salam, “Chemical Composition of Rain Water Collected at Urban and Rural Areas in Bangladesh” *16th Asian Chemical Congress*

- (16ACC), BUET, Dhaka, Bangladesh, 16-19 March, 2016.
- 5) M. Shohel, H.A. Simol, A. Salam “Fog and aerosol chemical characteristic of Bangladesh during winter season” *Second international workshop on Atmospheric Composition and the Asian summer Monsoon (ACAM)*, Swissôtel Le Concorde, Bangkok, Thailand, 8-10 June, 2015.

Instrumental Expertise:

Single crystal X-ray diffractometer (Rigaku Oxford Synergy/Bruker D8 Quest), Small Angle X-ray Scattering (Anton Paar SAXSess), SEM-EDS (Quanta 600), Powder X-ray diffractometer (Rigaku mini/Bruker D8 Discover), Raman microspectrometer (Thermo Nicolet Almega XR), Electrochemical Analyzer (Biologic SP200), ICP-MS (Agilent 7900), BET surface analyzer (BELSORP- mini II), Particle size analyzer (Zeta sizer Nano ZS90), Thermal analyzer (Hitachi TG-DTA 7200), Ion chromatography (Methohm 881 compact IC pro 1), Atomic Absorption Spectrophotometer, FT-IR, UV-Visible spectrophotometer, etc.

Specialized Training and Workshop:

Scientific Workshop Attended

- 1) *American Crystallographic Association*, Summer Course in Chemical Crystallography, Northwestern University, 23-30th June, 2019.
- 2) *Satellite and model data use for aerosols and air quality*, Asian Institute of Technology (AIT), Bangkok, Thailand, 11-12 June, 2015
- 3) *Characterization and Application of Novel Functional Materials*, Department of Chemistry, University of Dhaka, Bangladesh, August 31 and September 1, 2013
- 4) *Industrial Process Unit Operation and Process Control Technique*, Training Institute for Chemical Industries(TICI), Narsingdi, Bangladesh, 25th May- 20th June, 2013.

Professional Workshop Attended

- 1) *Certified Mentor Training*, National research mentoring network, Instructor: Dr. Lori Adams, Iowa Biosciences Academy, 2017 *For more information: <https://nrmnet.net/>
- 2) *Bridging Domestic and Global Diversity*, A semester long leadership training program designed to increase intercultural awareness and skills arranged by International Scholars and Student Service (ISSS), University of Iowa, 2019.

Professional Memberships:

American Chemical Society: student member (2020-present), Geological Society of America: student member (2019-2021), Pander Society (2019-present), Society for Sedimentary Geology-Great Lake Section: student member (2018-2019), American Crystallographic Association: student member (2019-2020).

References:

- **Professor Tori Z. Forbes**

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- **Professor May D. Nyman**

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- **Dr. Andrew W. Knight**

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