



Dr. M. Saiful Islam

Assistant Professor

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Education

2017	Post-doc	Chemistry and Material Science	Northwestern University
2012	Post-doc	Inorganic Chemistry	University of Bonn
2012	PhD	Inorganic Chemistry	University of Bonn
2012	MSc	Chemistry	University of Dhaka

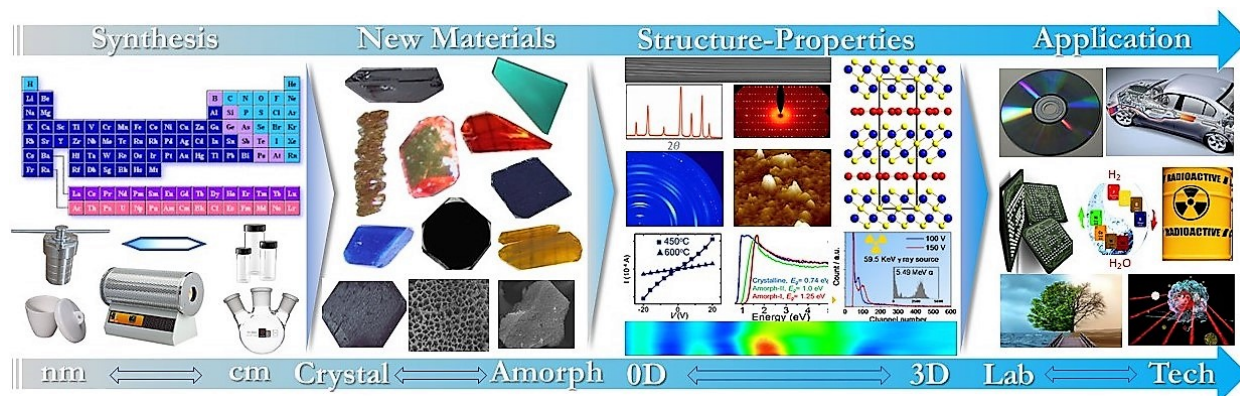
Teaching:

General Chemistry (CHEM-141)

Environmental Chemistry (CHEM-410, ENV-701)

Research Highlight

My research interest falls into an array of interdisciplinary areas: Solid State Chemistry, Materials Science and Environmental Chemistry. The central theme of my research is to uncover inorganic materials with exotic physical, chemical, optical and electrical properties. To pursue this goal my group focuses on synthetic inorganic chemistry of crystalline and amorphous materials, nano to microporous amorphous solids, heteroanionic composites, ultra-low density and high surface area gels, nanoparticles, and deposition of thin film. We converge numerous analytic tools to understand synthesis, morphology, and structure-function relationships of the newly synthesized materials. The ultimate goal of synthesizing such diverse classes of materials is to discover innovative materials that meet the required properties for specific applications such as environmental remediation of toxic heavy metals and radionuclides, phase change memory for high density data storage and faster computing, semiconductor based nuclear radiation detector, hydrogen evolution reaction catalysis, thermoelectric energy conversion, photovoltaic solar cells and biologically active materials.



Website: <https://sites.google.com/view/research-group-saiful-m-islam/home>

Selected Publications (Full List:

<https://scholar.google.com/citations?user=evKTULUAAAAJ&hl=en>)

- “Multi-states and Polyamorphism of Phase Change $K_2Sb_8Se_{13}$ ” Islam, S. M.; Peng, L.; Zeng, L.; Malliakas, C. D.; Chung, D. Y.; Buchholz, D. B.; Chasapis, T.; Li, R.; Chrissafis, K.; Medvedeva, J. E.; Trimarchi, G. T.; Grayson, M.; Marks, T. J.; Bedzyk, M. J.; Chang, R. P. H.; Dravid, V. P.; Kanatzidis, M. G.; *J. Am. Chem. Soc.*, **2018**, *140*, 9261–9268
- “Remarkable Acid Stability of Polypyrrole-MoS₄: A Highly Selective and Efficient Scavenger of Heavy Metals Over a Wide pH Range” Xie, L.; Yu, Z.; Islam, S. M.; Shi, K.; Cheng, L.; Yuan, M.; Zhao, J.; Sun, G.; Li, H.; Ma, S.; Kanatzidis, M. G. *Adv. Funct. Mater.* **2018**, 1800502
- “Conversion of Single Crystal $(NH_4)_2Mo_3S_{13} \cdot H_2O$ to Isomorphic Pseudocrystals of MoS₂ Nanoparticles” Islam, S. M.; Cain, J. D.; Shi, F.; He, Y.; Peng, L.; Banerjee, A.; Subrahmanyam, K. S.; Li, Y.; Ma, S.; Dravid, V. P.; Grayson, M.; Kanatzidis, M. G.; *Chem. Mater.*, **2018**, *30*, 3847–385
- “Rapid Simultaneous Removal of Toxic Anions $[HSeO_3]$, $[SeO_3]^{2-}$, $[SeO_4]^{2-}$, and Metals Hg^{2+} , Cu^{2+} and Cd^{2+} by MoS₄²⁻ Intercalated Layered Double Hydroxide” Ma, L.; Islam, S. M.; Xiao, C.; Zhao, J.; Liu, H.; Yuan, M.; Sun, G.; Li, H.; Ma, S.; Kanatzidis, M. G. *J. Am. Chem. Soc.* **2017**, *139*, 12745
- “Defect anti-perovskite compounds $Hg_3Q_2I_2$ (Q = S, Se and Te) for Room Temperature Hard Radiation Detection” He, Y.; Kontsevoi, O.; Stoumpos, C.; Trimarchi, G.; Islam, S. M.; Liu, Z.; Kostina, S.; Das, S.; Kim, J.; Lin, W.; Wessels, B.; Kanatzidis, M. G., *J. Am. Chem. Soc.*, **2017**, *39*, 7939
- “Homologous 2D Chalcogenides Cs-Ag-Bi-Q (Q = S, Se) with Ion-exchange Properties” Zhao, J.; Islam, S. M.; Hao, S.; Tan, G.; Stoumpos, C.; Wolverton, C.; Chen, H.; Luo, Z.; Li, R.; Kanatzidis, M. G., *J. Am. Chem. Soc.* **2017**, *139*, 12601
- “Semiconducting Pavonites $CdMBi_4Se_8$ (M = Sn and Pb) and Their Thermoelectric Properties” Zhao, J.; Islam, S. M.; Hao, S.; Tan, G.; Su, X.; Chen, H.; Lin, W.; Li, R.; Wolverton, C.; Kanatzidis, M. G. *Chem. Mater.* **2017**, *29*, 8494
- “Direct Gap Semiconductors $Pb_2BiS_2I_3$, $Sn_2BiS_2I_3$, Sn_2BiSI_3 ” Islam, S. M.; Malliakas, C. D. Sarma, S.; Maloney, D. C.; Stoumpos, C. C. Kontsevoi, O. O; Freeman, A. J. Kanatzidis, M. G. *Chem. Mater.* **2016**, *28*, 332
- “Molybdenum polysulfide chalcogenides as high-capacity, anion-redox-driven electrode materials for Li-ion batteries” Doan-Nguyen, V. V. T.; Subrahmanyam, K. S.; Butala, M. M.; Gerbec, J. C.; Islam, S. M.; Kanipe, K. N.; Wilson, Catrina, E.; Balasubramanian, M.; Wiaderek, K. M.; Borkiewicz, O. J. Chapman, K. W.; Chupas, P. J.; Moskovits, M.; Dunn, Bruce S.; Kanatzidis, M. G., Seshadri, R. *Chem. Mater.* **2016**, *28*, 8357
- “Porous Amorphous Chalcogenides as Selective Adsorbents for Heavy Metals” Fard, Z. H.; Islam, S. M.; Kanatzidis, M. G. *Chem. Mater.* **2015**, *27*, 6189
- “ $Cs_2Hg_3S_4$: A Low-dimensional Direct Bandgap Semiconductor” Islam, S. M.; Vanishri S.; Li, H.; Stoumpos, C. C.; Peters J. A.; Liu, Z.; Sebastian, M.; Wang, S.; Haynes, A.; Im, J.; Freeman, A. J., Wessels, B.; Kanatzidis, M. G. *Chem. Mater.* **2015**, *27*, 370
- “Efficient Uranium Capture by Polysulfide/Layered Double Hydroxide Composites” Ma, S.; Huang, L.; Ma, L.; Shim, Y.; Islam, S. M.; Wang, P. Zhao, L-D.; Wang, S.; Sun, G.; Yang, X.; Kanatzidis, M. G. *J. Am. Chem. Soc.* **2015**, *137*, 3670