

# *Metal Sulfides as Emerging Paradigm for the Sequestration of Toxic Heavy Metals and Radionuclides*

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**Chemistry Seminar on Heavy metal and Radionuclides sequestration**

**4:00 p.m.  
Monday  
May 2 via  
Zoom**

Please contact **Dr. Amitava Choudhury** at [choudhurya@mst.edu](mailto:choudhurya@mst.edu) for the zoom link.

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**Abstract:** Efficient treatment of wastewater such as industrial and nuclear waste effluents is one of the major concerns for countries all over the world. The design of an efficient and cost-effective adsorbent of toxic ions is of great interest to the scientific community. Metal sulfide is a remarkable class of materials that can lay out highly ordered crystalline and disordered amorphous solids with diverse structural features. Among these, the crystalline materials with molecular anionic features or open frameworks three- and two-dimensional structures display a rich abundance of sulfide that are exposed on building units. Similar exposure of sulfides is also observed in the meso to microporous amorphous metal sulfides. An integrated feature of the building motifs, surface-exposed basic frameworks and the strong Lewis acid-base interactions of the soft polarizable Lewis basic sulfides and Lewis acidic metal ions synergistically display an exceptional efficiency, selectivity, sorption kinetics for soft or relatively soft metal ions. Here, this research talk will focus on the rational design and the synthesis of metal sulfides with targeted sorption properties, structural features, and their applications in the sequestrations of chemically soft heavy metal and radioactive ions, as well as toxic gaseous species.

**About the speaker:** Dr. Saiful M. Islam is currently an Assistant Professor of Chemistry, Physics, and Atmospheric Sciences at Jackson State University since 2017. He earned his BSc (2004) and MSc (2006) in Chemistry from the University of Dhaka, Bangladesh, and a Ph.D. in Chemistry from the University of Bonn Germany in 2011. He worked as a postdoc at the University of Bonn from 2011-2012; at Northwestern University from 2012-2017. At Northwestern, he also worked as an adjunct faculty.

He received German Academy Exchange Award for his Ph.D. studies; US Department of energy's visiting award for his research at Oak Ridge National Laboratory in 2018. In 2019, he also worked at Army Research Laboratory (Adelphi, MD) as a visiting researcher.

Since joining Jackson State University Dr. Islam was awarded about 1.1 million federal grants from the US Department of Energy, National Science Foundation, and US Department of Education.

He also served as an NSF panelist at the Division of Material Research. Besides, he served as a vice chair (2019-2021) and chair (2021-2022) for the Mississippi Academy of Sciences for the division of chemistry and chemical engineering. Dr. Islam's current research focuses on Materials and Environmental Chemistry. He published 42 papers in peer-review journals and one patent.