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Sulphur functionalized nanomaterials for monitoring and trapping heavy metals in water environment

Ankit Dodla¹, Shobha Shukla², Tanveer Adyel³, and Sumit Saxena²

¹IIT Bombay Monash Academy, IIT Bombay, Metallurgical and Material Science, India (ankit.dodla@iitb.ac.in)

²Metallurgical and Material Science Engineering, IIT Bombay, Bombay, India

³Department of Civil Engineering, Monash University, Melbourne, Australia

Extensive industrialization and urbanization have adversely affected the quality of consumable water on the earth. The industrial effluents are the major source of micropollutants such as heavy metals, which deteriorates the environment making it toxic to the flora and fauna sustaining in the water. Heavy metals such as lead, cobalt, arsenic, chromium, and mercury are toxic even in trace amounts, whereas presence of higher concentration of iron, cobalt and zinc could be detrimental. Bioaccumulation and hypertoxicity of these heavy metals mark them one of important micropollutants to be monitored. Most of these heavy metals are soft Lewis acid metals such as **Ag⁺**, **Au⁺**, **Cd²⁺**, **Hg²⁺**, **Pb²⁺** are considered as thiophilic. In nature, proteins responsible for metabolizing and binding to heavy metals are rich in sulphur functionalized groups such as cysteine and glutathione. This work will address the various sulphur functionalized nanomaterials which are inspired by nature will enhance the monitoring and trapping of heavy metals in water environment.