Department of Chemistry, IIT Madras

Research Proposal Seminar

Interaction of Arsenic Ions with Iron Oxides/Oxy-Hydroxides

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Date: 09. 09. 2019

Venue: CB 310
Time: 3:00 – 4:00 pm

Abstract

Arsenic is one of the major contaminants in drinking water in many parts of the world. Various parts of India, Bangladesh, Cambodia, South Africa, Argentina, United States, and other countries have arsenic in the groundwater to an extent more than the permissible limit, namely 10 $\mu g.L^{-1}$ (10 ppb) prescribed by the World Health Organization (WHO).[1] Arsenic occurs in natural waters as either arsenite (As(III)) or arsenate (As(V)).[2] Both forms of arsenic have strong affinity for iron oxide/oxyhydroxide surfaces near neutral pH.[3] The speciation of arsenic is an important aspect for understanding its mobility, bioavailability, and toxicity in groundwater.[4] This seminar will give an overview of the research done on arsenic speciation and their interactions with iron oxides/oxy-hydroxides, especially nanocomposites for their purpose in arsenic removal. However mainly focuses on the oxidation state of iron in confined meta stable 2-line ferrihydrite, magnetite, and hematite upon complexation with arsenic species was studied using X-ray Photoelectron Spectroscopy (XPS). Adsorption kinetics of common arsenic species (H_3AsO_3, $H_2AsO_4^{1-}$, and $HAsO_4^{2-}$) which exist at pH = 7, studied using Raman Spectroscopy.

References

(1) *Guidelines for Drinking-Water Quality*; WHO Press, World Health Organization: Switzerland, 2011

(2) Mahler, J. *et al. Dalton Transactions* **2013**, *42* (5), 1364.

(3) Yan, W. *et al. Environ. Sci.Technol.* **2012**, *46* (13), 7018.

(4) Mota, A. M. *et al. J. Phys. Chem. A* **2012**, *116* (25), 6433.

Guide

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