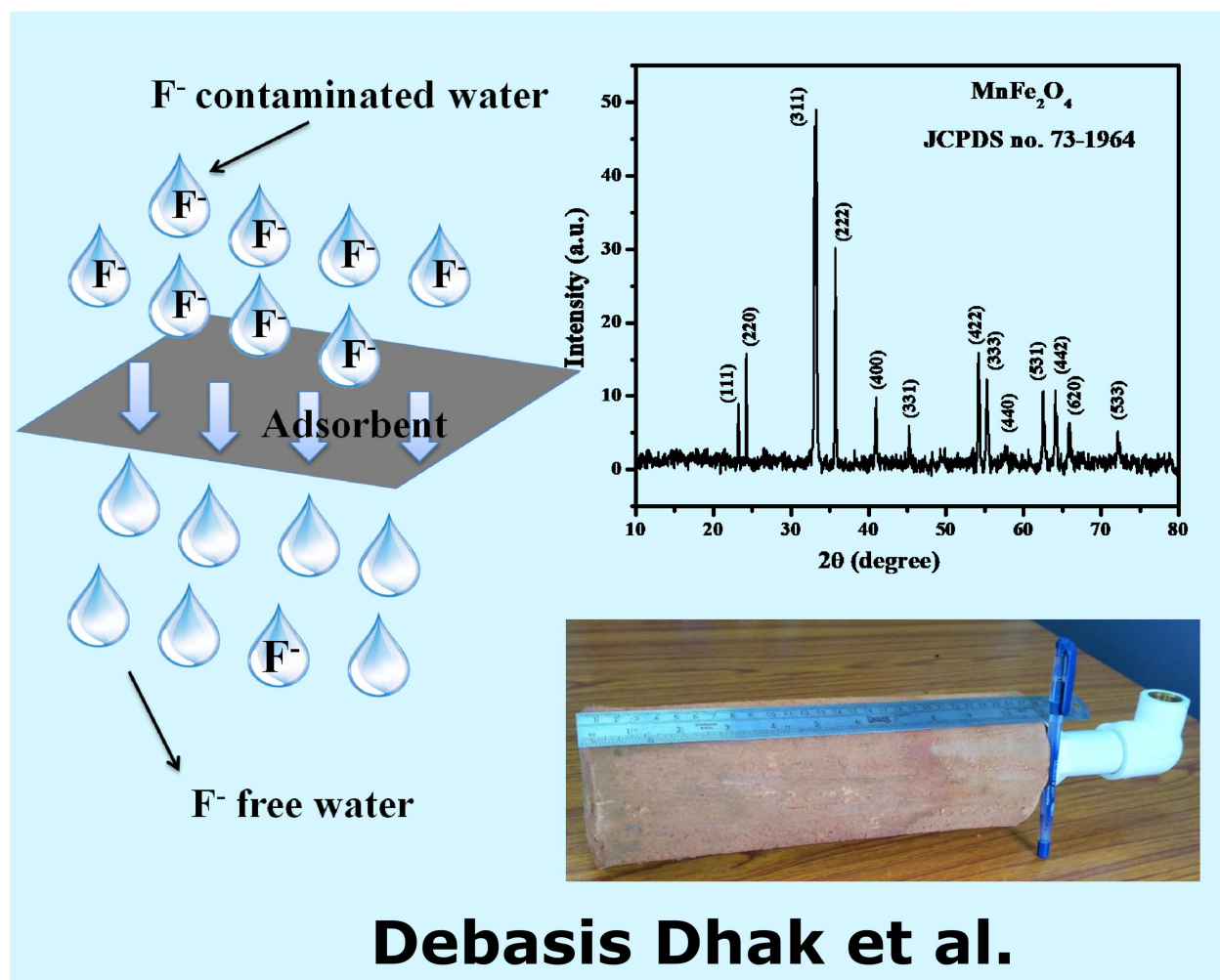


Removal of Fluoride from Drinking Water Using Bimetallic Nano Adsorbent MnFe_2O_4 Prepared by Chemical Route

Julekha Khatun, Mrinal Kanti Adak, and Debasis Dhak*

Nanomaterials Research Lab, Department of Chemistry, Sidho-Kanho-Birsha University, Purulia – 723104, India

*E-mail: debasisdhak@yahoo.co.in, debasis_dhak.chem@skbu.ac.in



Debasis Dhak et al.

Abstract: MnFe_2O_4 (MFO) bimetallic nano-adsorbents were prepared using chemical precursor decomposition method. Calcinations of the carbonaceous precursor mass at 700°C , 4 h lead to the phase formation. The single crystalline cubic structure was confirmed by the X-ray diffraction study (XRD). The average crystallite size was 19 nm. Fourier transform infrared spectroscopy (FTIR) was performed both before and after the fluoride removal. Fluorinated aqueous solutions of 3 ppm, 5 ppm and 10 ppm were prepared to perform the fluoride removal tests. The

adsorption times were considered to be 15 min, 30 min, 45 min and 60 min varying the adsorbent doses in the range from 0.1 mg to 0.3 mg for every 100 ml fluorinated aqueous solution. Almost 67% fluoride was removed using MFO with adsorbent dose 0.05g/ 100mL. The adsorption process occurred through chemi-adsorption process. The contact time and initial fluoride concentration were found to be very selective.

Keywords: Nano adsorbent, Drinking water, Fluoride removal, Chemical synthesis