

Theme 11: Climate change and natural disasters

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INVESTIGATION ON LOW COST ADSORBENT FOR ARSENIC REMOVAL FROM TRIBAL AREA OF WEST BENGAL & JHARKHAND

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Arsenic (As) is a geogenic water menace affecting millions of people world over. The problem of arsenic pollution is too severe in some tribal areas of Purulia, Burdwan & Dhanbad districts of West Bengal & Jharkhand. The conventional treatment technologies for arsenic removal are very costly and unaffordable for the rural areas. Hence the present study was undertaken to assess the efficiency of adsorption using various adsorbents as a feasible and economical technique, which can be easily used at small scale or point-of-use (POU) household applications. Adsorption study was carried out using nine sets of adsorbents viz; Sand, Fly ash, and their mixture (1:1) with and without coating of ferric nitrate and manganese di oxide. The study was carried out under varying experimental conditions of adsorbent dosage, pH, contact time and initial concentration for all the nine alternatives. The study revealed that maximum Arsenic removal was observed by sand coated with ferric nitrate, which gave 99.99% removal at initial As concentration of 10mg/l at pH 7. Adsorption equilibrium study dictated that adsorption of As(V) follows Langmuir isotherm compared to Freundlich isotherm. The sorption kinetics was found to follow the pseudo-second order model.

Keywords: Adsorption, Low cost adsorbent, Arsenic (v), Adsorption isotherms, kinetics