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Effective utilization of agricultural and vegetable waste and aquatic macrophyte for defluoridation from aqueous medium through batch and column study

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Elevated intake of fluoride (F), mainly through drinking water, is a major threat to human health worldwide. Present work is concerned with the defluoridation capacities of *Eichhornia sp.,* potato peel dust, and rice husk using batch and column sorption techniques. The batch techniques were done by using *Eichhornia sp*. and potato peel. In the batch study, the dynamics of F sorption, with respect to pH, $[F]_o$ and sorbent dose, particle size, stirring rate, and temperature were considered. The adsorbents *Eichhorniasp.,* and potato peel nicely fitted with D-R and Freundlich isotherms, respectively. The kinetics data were found to fit well with pseudo-second order for both the adsorbents. The interaction of co-ions in the defluoridation capacity of the sorbent was studied. Column experiments were carried out by agricultural waste, rice husk. The column techniques were done by varying flow rate, $[F]_o$, pH and bed depth. The service time and adsorption capacity increased with increasing initial concentration of F and bed depth for rice husk. Both BDST and Thomson model were nicely fitted with the column experimental results. The characterization of the sorbents, *Eichhornia sp.,* rice husk and potato peel were done using the FTIR and SEM techniques. Finally, it has been found agricultural waste, rice husk remove maximum (99.20 %) F through column study.

Biography

Naba Kumar Mondal is presently holding the position as Assistant professor in the department of Environmental Science, The University of Burdwan, India. He has an experience more than 16 years of teaching and research in both Education and Environmental Science (masters degree). His research interest includes: Adsorption Chemistry, Nutrient dynamics, indoor pollution, soil Chemistry, Plant Physiology etc. He has also published about 120 research papers in reputed International and National Journals and four (04) PhD scholars (upto May' 2014) and has been serving as an guest Editor and reviewer in many prestigious international Journals.

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