



Preparation of rice husk ash silica-hydroxyapatite adsorbent for defluoridation of water: Kinetic and equilibrium studies.

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Abstract: Silica-hydroxyapatite adsorbent was prepared and tested of its applicability in the defluoridation of water. Rice husk ash from *Oryza glaberrima* rice was used as a silica source. The adsorbent had a bulk density of $0.12 \text{ g}\cdot\text{cm}^{-3}$. Studies on the effect of contact time, adsorbent dosage, pH and initial fluoride concentration were performed. A maximum adsorption capacity of $5.53 \text{ mg}\cdot\text{g}^{-1}$ was achieved at a pH of 5. The data fitted well with the Freundlich adsorption isotherm, confirming a multi-layer diffusion. FTIR spectra of adsorption material confirmed the presence of typical absorption bands. The XRF measurements confirmed the presence of major components, Si, Ca and P. XRD confirmed the presence of calcium hydroxyapatite and about 77 % amorphous silica.

Key words: adsorbent, defluoridation, fluorosis, hydroxyapatite, rice husk ash, silica.

Mupa M.Mapfaire E. *et al*/International Journal of ChemTech Research, 2016,9(9),pp 75-84.
