

DEFLUORIDATION OF WATER USING BAUXITE ADSORBENT

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Abstract

Fluoride is an essential constituent for both humans and animals depending on the total amount ingested or its concentration in drinking water. The presence of fluoride in drinking water, within permissible limits of 0.5 – 1.0 mg/l, is beneficial for the production and maintenance of healthy bones and teeth, while excessive intake of fluoride causes dental and skeletal fluorosis. The present paper deals with the removal of fluoride ions using bauxite. The effects of some of the major parameters of adsorption such as pH, dose of adsorbent, contact time and initial fluoride ion concentration on fluoride removal efficiency were studied and optimized. The optimum adsorbent dose was found to be 5 g/100 ml, the equilibrium contact time was found to be 75 minutes and maximum adsorption obtained at pH 6. Maximum fluoride removal was observed to be 94.2 % at optimum conditions. Sorption data have been correlated with Langmuir and Freundlich isotherms. Langmuir isotherm fits well for defluoridation of water using bauxite.

Keywords: Fluoride, Adsorption, Bauxite, isotherm, Langmuir, Freundlich