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Fe(II) AND Mn(II) REMOVAL FROM CONTAMINATED GROUNDWATER BY ADSORPTION: A COMPARISON OF ACTIVATED CARBON AND PINE BARK

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Abstract

This paper aims to compare the adsorption performance of activated carbon and pine bark for iron and manganese removal from contaminated groundwater. Moreover, their environmental compatibility was checked for their possible use as reactive media in a permeable reactive barrier for in situ remediation. Batch tests were carried out with different iron and manganese concentrations and different particle-size distributions, in order to evaluate the effectiveness of the activated carbon and pine bark on removal depending on both the initial pollutant concentration and the surface area of the adsorbent. High removal efficiencies were reached by both of the reactive media. However, faster removal at higher concentration was observed only for iron adsorption by activated carbon. The particle-size distribution did not significantly influence the process in the experimental conditions tested. The immobilization process on the reactive media can be considered almost irreversible since the quantities of iron and manganese released during the desorption tests were negligible.

Key words: adsorption, biosorbents, contaminated groundwater, heavy metals

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