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Th(IV) removal from aqueous solutions by oxidized biochar prepared from palm tree fibers

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Abstract

The removal of Th(IV) from aqueous solutions by oxidized biochar fibres derived from palm tree fibers (OBF) has been investigated at pH 3 and under ambient conditions by batch type experiments and FTIR spectroscopy. The experimental data have shown that the Th(IV) adsorption by OBF is well fitted by the Langmuir isotherm model ($q_{\max} = 0.18 \text{ mol kg}^{-1}$ or 42 g kg^{-1}), is an entropy-driven process and follows the 2nd order kinetics. Furthermore, FTIR spectroscopic data have indicated that the sorption occurs via formation of inner-sphere complexes between Th(VI) and the carboxylic surface moieties.

Keywords

Th(IV) adsorption; biochar fibers, q_{\max} ; kinetic parameters; mechanism

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