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Adsorption behaviors of lead ion onto acetate modified activated carbon fiber

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ABSTRACT

Activated carbon fiber (ACF) was modified with acetates of sodium, potassium and lithium at concentration of 15% and tested to adsorb lead from aqueous solution. The effect of acetate treatments of ACF was studied in adsorption behavior of lead ion. Acetate treatment reduced surface area and pore volume of ACF, but the adsorption amount of lead ion on the modified ACF (MACF) was greater than that on the pristine ACF. The adsorbed lead could be fully desorbed by using 0.01 mol/L HNO_3 solution. The maximum adsorption capacity of lead ion on acetate lithium modified ACF was 165.1 mg/g and the adsorption isotherm follows Langmuir isotherm model better than the Freundlich isotherm model. The adsorption kinetic data could be described well by the Lagergren pseudo-second-order kinetic equation.

Keywords: Activated carbon fiber; Surface treatment; lead; Adsorption; Desorption

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