



A novel process for bromate removal from water using calcined Zn–Al layered double hydroxides

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ABSTRACT

Zn–Al layered double hydroxides (Zn–Al LDHs) and their calcined products (Zn–Al CLDHs) were synthesized and used to remove bromate. The factors influencing the bromate adsorption were discussed. The process of bromate adsorption by Zn–Al CLDHs samples is rapid. As much as 98% of the bromate can be effectively removed under the reaction condition of Zn–Al CLDHs dosage of 0.8 g/L, neutral pH, reaction temperature of 293 K, and initial bromate concentration of 100 µg/L. Moreover, the adsorption isotherms of bromate adsorption on CLDHs are well fitted by the Freundlich equation, and the process of bromate adsorption by Zn–Al CLDHs can be regarded as an exothermic reaction. The regenerated Zn–Al CLDHs samples are also effective in bromate adsorption, which suggests that Zn–Al CLDHs have the potential for reuse. The results of this study suggest that Zn–Al CLDHs show potential for developing a simple process for a field application to remove bromate from water.

Keywords: Bromate; Isotherms model; Regeneration; Thermodynamics; Zn–Al layered double hydroxides

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