Synthesis of Mg/Al double-layered hydroxides for boron removal

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Received 4 March 2013; Accepted 16 April 2013

ABSTRACT

About 5 mg/L boron are present in seawater. Excessive boron is harmful to living beings so, boron removal is extremely essential in seawater desalination process. Mg/Al double-layered hydroxides (Mg–Al–LDHs) materials, which show excellent boron removal properties, were synthesised by chemical co-precipitation method in this paper. The effects of molar ratio of Mg/Al, concentration of solution, reaction time and temperature, drying time and temperature on boron removal capacity were evaluated. All the experimental conditions had an influence on boron removal capacity by affecting the degree of crystallinity and crystallite size. The concentration of solution has a notable effect on boron adsorption property of LDHs. The products calcined in 450˚C had a better boron removal capacity. The best adsorption capacity for boron was 33 mg/g.

Keywords: Boron; Mg/Al double-layered hydroxides; Adsorption; Co-precipitation

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