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Removal of boron from aqueous solution using magnesite and bentonite clay Composite

Vhahangwele Masidi, Mugeru W. Gitari, Hlanganani Tutu, Marinda De Beer

### **ABSTRACT**

The removal of boron from industrial effluents using the composite was studied in batch equilibration technique. The effects of equilibration time, adsorbent dosage, concentration and pH on removal of boron were investigated. The experiments demonstrated that boron removal is optimum at 30 min of agitation, 1 g of dosage and 20 mg L<sup>-1</sup> of ion concentration. Adsorption of boron by the composite was independent of pH. The adsorption data fitted well into both Langmuir adsorption isotherm and Freundlich adsorption isotherm hence proving monolayer and multilayer adsorption. The kinetic studies reported that the data favours pseudo-second-order reaction than first order hence proving chemisorption. Under optimized conditions, the composite was able to remove boron to below World Health Organization (WHO) water quality guidelines. Henceforth, it was concluded that this comparative study will be helpful for further application in the treatment of boron-contaminated water.

Keywords: Bentonite clay; Magnesite; Composite; Boron; Kinetics; Adsorption