

Interaction of Mn^{2+} , Fe^{2+} and Cu^{2+} heavy metal ions from aqueous solution by zaccagnaite, a hydrotalcite-like compound

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ABSTRACT

The paper deals with the interaction of heavy metal ions Mn^{2+} , Fe^{2+} and Cu^{2+} with synthesized zaccagnaite, a hydrotalcite like compound, which acts as an adsorbent in aqueous solutions. Zaccagnaite was synthesized by the co-precipitation method and was characterized by XRD. All experiments were carried out by adjusting pH in the range 5.2–5.5. The use of buffer solution was avoided because the net interaction between the adsorbent and the heavy metals could have been destroyed by the components of the buffer solution. The equilibrium adsorption contact time was determined for zaccagnaite. The adsorption rate constants were determined from the kinetic curves which obey the first degree rate constant. Adsorption isotherms of the above said metals on zaccagnaite from aqueous solutions were determined. The adsorption isotherms were seen to be consistent with Freundlich's adsorption isotherm. From this experiment it was found that the zaccagnaite is a better adsorbent for the removal of Cu^{2+} than Fe^{2+} and Mn^{2+} .

Keywords: Heavy metal; Adsorption; Zaccagnaite; Adsorption isotherm; XRD

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