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CHARACTERIZATION OF Cr(VI) REMOVAL BY CALCITE-HEMATITE COMPOSITE

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Abstract

In the present study, calcite-hematite composite was prepared by coprecipitation method at pH 10 and at pH 12. The XRD analysis confirms the formation of both calcite and hematite in the two cases. Batch experiments were undertaken for characterizing the efficiency of the prepared composite for Cr(VI) removal from water. Effects of pH, temperature, contact time and Cr(VI) initial concentration were studied. The obtained results reveal that Cr(VI) removal is favorable at acidic pH. At pH 4, removal percentage of about 80% is obtained at equilibrium either the composite was prepared at pH 10 or at pH 12. Cr(VI) adsorption by the prepared calcite-hematite composite is spontaneous and exothermic whatever the pH of the preparation. In addition, the removal kinetics is well described by the second-order model both at acidic and neutral pH. The maximal adsorption capacities calculated by Langmuir equation suggest that the pH of the preparation has no effect when Cr(VI) is removed at pH 4. In this case, the maximal adsorption capacity is about 9mg Cr(VI)/g whether the composite was prepared at pH 10 or at pH 12.

Key words: calcite, composite, Cr(VI), hematite, water treatment

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