

Use of Diatomite for the Elimination of Chromium Three from Wastewater Annaba, Algeria

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Abstract : The wastewater was treated with a natural adsorbent "Diatomite" to eliminate chromium three. Diatomite is an element that comes from Sig (west of Algeria). The physicochemical characterization revealed that the diatomite is mainly made up of silica, lime and a lower degree of alumina. The process considered in static regime, at 20°C, an ion stirring speed of 150 rpm, a pH = 4 and a grain diameter of between 100 and 150µm, shows that one gram of diatomite purified can fix according to the Langmuir model up to 39.64 mg/g of chromium with pseudo 1st order kinetics. The pseudo-equilibrium time highlighted is 25 minutes. The affinity between the adsorbent and the adsorbate follows the value of the RL ratio indicates us that the solid used has a good adsorption capacity. The external transport of the metal ions from the solution to the adsorbent seems to be a step controlling the speed of the overall process. On the other hand, internal transport in the pores is not the only limiting mechanism of sorption kinetics. Thermodynamic parameters show that chromium sorption is spontaneous and exothermic with negative entropy.

Keywords : adsorption, diatomite, Cr(III), wastewater

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