World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:9, No:04, 2015

Cobalt Ions Adsorption by Quartz and Illite and Calcite from Waste Water

Authors : Saad A. Aljlil

Abstract : Adsorption of cobalt ions on quartz and illite and calcite from waste water was investigated. The effect of pH on the adsorption of cobalt ions was studied. The maximum capacities of cobalt ions of the three adsorbents increase with increasing cobalt solution temperature. The maximum capacities were (4.66) mg/g for quartz, (3.94) mg/g for illite, and (3.44) mg/g for calcite. The enthalpy, Gibbs free energy, and entropy for adsorption of cobalt ions on the three adsorbents were calculated. It was found that the adsorption process of the cobalt ions of the adsorbent was an endothermic process. consequently increasing the temperature causes the increase of the cobalt ions adsorption of the adsorbents. Therefore, the adsorption process is preferred at high temperature levels. The equilibrium adsorption data were correlated using Langmuir model, Freundlich model. The experimental data of cobalt ions of the adsorbents correlated well with Freundlich model.

Keywords : adsorption, Langmuir, Freundlich, quartz, illite, calcite, waste water
Conference Title : ICCEES 2015 : International Conference on Chemical, Ecology and Environmental Sciences
Conference Location : Lisbon, Portugal
Conference Dates : April 16-17, 2015