

The Characterization of Jordanian Porcelanite Rock in Water Treatment

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Abstract

The adsorption of Pb ions and 3,5-Dimethyl phenol from aqueous solution by Jordanian porcelanite rock has been investigated as a function of initial concentration, adsorbent dose and contact time at constant temperature and pH of solution. The equilibrium process was described by Langmuir and Freundlich isotherm model with maximum sorption capacity equal to 19.562 mg g^{-1} , removal efficiency of 95 – 98% at about 40 minute of contact time, with 0.5 g of porcelanite and 10 – 30 ppm concentrations in metallic solutions, which is simulated by applied on car washing station wastewater. And get removal efficiency equal to 99.71% at about 1 hour of contact time, with 20 g of porcelanite and about 50 ppm concentrations of 3,5-Dimethyl phenol in organic solutions which was indicated by Total Organic Carbon and Ultra Violet/Visible absorption spectroscopy technique. The physical and chemical characterization, i.e. X-Ray Fluorescence, X-Ray Diffraction, Scanning Electron Microscope, Thermogravimetry analysis and Specific Surface Area have also been investigated for the Jordanian porcelanite rock which represents an alternative natural adsorbent. Porcelanite is a low cost material could be used for the removal of toxic inorganic and organic materials, in addition to its ability to be used as a filter.