عنوان مقاله:

Evaluation and Optimization of Chromium Removal from Synthetic Aqueous Solutions by Powdered Spirogyra

محل انتشار:

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خلاصه مقاله:

Aims Heavy metals are the main pollutants in nature. Chromium is a heavy metal which iswidely used. Hexavalent chromium solubility and mobility in aqueous solutions is so highand it is easily reduced. Biosorption is a process in which heavy metals are uptake throughpassive binding by nonliving biomass from aqueous solutions. The present study aimedto determine the capability of powdered Spirogyra to remove chromium from syntheticaqueous solutions under the influence of process parameters includes pH, algal dosage, andmetal initial concentration.Materials & Methods This study was empirically carried out in laboratory scale througha batch system in Kashan region, Iran, in September 2014. Hexavalent chromium stocksolution (500mg/l) was made by solving 1.417g of dichromate potassium in 1 liter of distilledwater. The experiments were conducted with initial concentration of 10, 25, and 40mg/l ofhexavalent chromium in pH levels equal to 3, 7 and 11 and algal dosages of 0.2, 0.5 and 1g/l.The repeated-measure test was applied for statistical analysis using SPSS 16 software.Findings Maximum value of chromium removal was observed at pH=3 (70%). Hexavalentchromium removal value increased with increasing algal dosage from 0.2g/l (45%) to 1g/l(70%) in 100ml samples with 40mg/l concentration of Cr(VI). The amount of Cr(VI) boundby unit weight of biomass were increased from the initial concentration of 10 to 40mg/labout 27mg/g in all levels of pH.Conclusion Low dosages of powdered Spirogyra can remove hexavalent chromium fromwastewater and aqueous solutions.

کلمات کلیدی:

Absorption, Physiological; Hexavalent Chromium Ion; Spirogyra; Metals, Heavy