

Competitive metal sorption and desorption onto kappaphycus alvarezii, seaweed waste biomass

Abstract

Competitive metal sorption and desorption onto Kappaphycus alvarezii waste biomass were investigated. Metal sorption capacities were 0.82 mg Cr(III)/g, 0.73 mg Ni(II)/g, 0.67 mg Cd(II)/g, 0.65 mg Cu(II)/g and 0.64 mg Zn(II)/g in multi metal system. Whereas, desorption efficiencies were 66.08%, 71.50% and 80.44% using 0.1M HNO₃, 0.1M HCl and 0.1M H₂SO₄, respectively. The metal sorption sequence were Cr(III) > Ni(II) > Cd(II) > Cu(II) > Zn(II), while metal desorption sequence were Cd(II) > Zn(II) > Cu(II) > Ni(II) > Cr(III). Fourier transformed infrared spectroscopy (FTIR) technique was used to characterize the seaweed waste biomass. FTIR analysis shown that carbonyl (-C=O) and nitrile (-C≡N) groups interact with the metal ions. The experiments result revealed that Kappaphycus alvarezii waste biomass represent an attractive candidate to remove multi metal ions.