



Adsorption study of Pb(II) onto a novel calix[4]resorcinarene-chitosan hybrid

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ABSTRACT

Adsorption of Pb(II) ions by a novel calix[4]resorcinarene-chitosan hybrid (CCH) compared with tetrakis-chloromethyl-C-4-allyloxy-3-methoxyphenylcalix[4]resorcinarene (CAMR) and chitosan adsorbent using the batch method has been carried out under variations of pHs, contact times, and Pb(II) ion concentrations. The optimum conditions of the adsorption of Pb(II) ions occurred at pH of 5 for CCH and CAMR adsorbent with the contact time for 2 h and at pH of 2 for chitosan adsorbent. The results show that the adsorption process of Pb(II) ions by the CCH, CAMR, and chitosan adsorbents is pseudo-second-order kinetic model with the rate constant (k) of 6.86×10^{-2} g/mg min for CCH. In addition, the adsorption model of Pb(II) ions by CCH tends to follow Freundlich adsorption isotherm model, while CAMR and chitosan adsorbent tends to follow Langmuir adsorption isotherm model. Adsorption capacity (X_m) of CCH to Pb(II) ion is the largest than CAMR and chitosan. Thus, the CCH is the potential alternative adsorbent to absorb of Pb(II) ions.

Keywords: Calix[4]resorcinarene-chitosan hybrid; Adsorption; Pb(II) ion

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