New amphoteric chelating /ion exchange resins with substituted carbamylethylenephosphonates ; synthesis and EPR studies of their Cu(II) complexes.

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Streszczenie

Two new chelating/ion-exchange resins have been obtained by amination of vinylbenzyl chloride–styrene–divinylbenzene copolymer, bearing ethoxycarbonylethyl phosphonate, with ethylenediamine and diethylenetriamine. The effect of close proximity of acidic and basic sites of ligand on chelating/ion-exchange of four divalent metal cations has been studied. In order to explain the behavior of the synthesized resins, a series of reference resins has been obtained. These resins have same types of functional groups—phosphonic acid and *N*-substituted amide of carboxylic acid but deposited randomly within polymer material. It has been found that close proximity of both acidic and basic sites, interacting with each other, gave antagonistic effect at pH 3.7 and 5.6 and suppressed uptake of Cu(II), Cd(II), Ni(II) and Zn(II) from weakly acidic solutions. For example Resins 1 and 2 with carbamylethylenephosphonates displayed at pH 3.7 $\log K_d$ Cu(II) 2.10 and 3.06, whereas reference Resins 3 and 4 had $\log K_d$ Cu(II) 2.83 and 4.50, respectively. EPR studies of Cu(II) complexes formed in each case were used to explain the observed effect.

Słowa kluczowe

Chemical modification, Chelating resins, EPR studies

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