

Potentiometric and spectroscopic studies of the copper(II) complexes with some aminodiphosphonic acids in aqueous solution.

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Streszczenie

The stoichiometries and stability constants of the copper(II) complexes with seven aminodiphosphonates [R–N(CH₂PO₃H₂)₂, L] containing iminomethylenephosphonate moieties have been determined pH-metrically at 25°C and at an ionic strength of 0.20 mol dm^{–3} (KCl). The results suggest for L=1–6 only equimolar species: [Cu(H₂L)], [Cu(HL)], [CuL] and two hydroxo [CuH_{–1}L] and [CuH_{–2}L], in the pH range of 2–11.5, the only difference is the presence of an additional [Cu(H₃L)] species (~15%) at low pH for N-3-picolyliminodi(methylenephosphonic) acid. For L=7 the model contains protonated and non-protonated 1:2 species. From the comparative analysis of the stability and the spectroscopic (UV–VIS and EPR) data it has been established that the ligands in [CuHL] and [CuL] are tridentate; the formation of two five-membered chelate rings leads to very stable complexes. The LMCT bands from O[–] (PO₃^{2–}) and N_{imino} to Cu² are at 225–231 and 302–277 nm.

Słowa kluczowe

potentiometry, stability constants, copper(II) complexes, aminopolyphosphonates, EPR spectra, UV–VIS spectra

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