Potentiometric and spectroscopic studies of the cobalt(II), nickel(II) and manganese(II) complexes with some aminodiphosphonic acids in aqueous solution.

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Streszczenie

The stoichiometries and stability constants of the manganese(II), cobalt(II) and nickel(II) complexes with seven aminodiphosphonates [$RN(CH_2PO_3H_2)_2$, 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: $[M(H_2L)]$, $[M(HL)]^-$, $[ML]^{2-}$ and hydroxo $[MH_{-1}L]^{3-}$, in the pH range of 3–11.5, the only difference is the presence of an additional $[M(H_3L)]^+$ species at low pH for*N*-3-picolyliminodi(methylenephosphonic) acid. For L=**7** the models contain protonated and non-protonated 1:2 species. From the comparative analysis of the stability and the spectroscopic (UV–VIS) data it has been established that the ligands coordinate to the metal ions only by the phosphonate group(s) in a monodentate or bidentate manner. The LMCT bands from $O^-(PO_3^{2-})$ to Ni^{2+} are at 222–211 nm.

Słowa kluczowe

Potentiometry, Equilibria, Stability constants, Manganese(II), Cobalt(II), Nickel(II) complexes, Aminopolyphosphonates, UV–VIS spectra

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