The role of the carboxylic group in the copper(II) mixed-ligand complexes of DL-aspartic acid-β-hydroxamic acid and polyamines.

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Streszczenie

Equilibrium studies of the mixed-ligand complexes of the Cu^{2+} ion with polyamines {ethylenediamine (1,2-diaminoethane, en), diethylenetriamine (bis(2-aminoethyl)amine, dien) or pentamethyldiethylenetriamine (*N*,*N*,*N*′,*N*″,*N*″-pentamethyl-[bis(2-aminoethyl)amine], Me_5dien)} as a primary ligand A, and dl-aspartic acid-β-hydroxamic acid (*N*-hydroxyasparagine, Asp-β-ha) as a secondary ligand L were performed by potentiometric titration and UV–Vis and EPR spectroscopy. The results show that the parent and two mixed-ligand complexes, [CuA(HL)] and [CuA(L)], are formed. In the first [CuA(HL)] species the amino nitrogen and carboxylate oxygen of Asp-β-ha are the coordinating donor atoms (glycine-like coordination) and in the second [CuA(L)] species the amino and hydroxamate nitrogens are the coordinating donor atoms of this ligand. The first manner of coordination predominates in acidic and neutral solutions while the second one in basic solution.Absorption (UV–Vis) and EPR spectra at various pH values indicate a five-coordinate structure of the formed complexes with a geometry close to a square-pyramid in the case of dien and trigonal bipyramid in the case of Me_5dien. In the binary copper(II)–aspartic acid-β-hydroxamic acid system the occurrence of a pentanuclear complex was confirmed.

Słowa kluczowe

Aminohydroxamic acids, Five-coordinate complexes, Mixed-ligand complexes, Equilibria, Polyamines, Spectroscopic studies

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