Cu^{2+} coordination properties of a 2-pyridine heptaamine tripod: characterization and binding mechanism.

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Streszczenie

The synthesis, protonation, and Cu^{2+} coordination chemistry of a tripodal heptaamine ligand ($\mathbf{L^1}$) functionalized with 2-pyridine fragments at the ends of its three branches are reported. $\mathbf{L^1}$ presents six relatively high protonation constants followed by much more reduced constant that as indicated by the UV−vis and NMR data, occur on the pyridine fragments. p[H]-metric, ESI/MS^+, EPR and UV−vis data show that$\mathbf{L^1}$ is able to form mono-, di-, and trinuclear Cu^{2+} complexes. Slippage movements and molecular reorganizations have been observed to occur as a function of p[H] in the 1:1 Cu^{2+} complexes. The kinetic studies showed that the complex formation is fast and proceeds through a dissociative Eigen−Wilkins mechanism. The decomposition of Cu$\mathbf{L^1}$ upon addition of acid excess occurs with two separate kinetic steps; the rate constant for the fast process does not vary with respect to the H^+ concentration whereas a linear dependence on H^+ is observed for the slow step.

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