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Properties of N,N-dimethyl-N′-(2-hydroxybenzyl)ethylenediamine as a ligand to copper(II)

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Abstract

The acid-basic and complexing properties of N,N-dimethyl-N′-(2- hydroxybenzyl)ethylenediamine (HL) in aqueous propan-2-ol were characterized by spectrophotometry, pH-metry, and mathematical simulation of equilibria in solutions (T = 25 ± 0.1°C, μ = 0.1 M KNO 3). Dimer H 2L 2 was found to predominate in solution at c HL = 0.01 mol/l. Three protonated dimeric (H 3L 2 +, H 4L 2 2+, and H 5L 2 3+), diprotonated monomeric (H 3L 2+), and triprotonated tetrameric forms (H 7L 4 3+) were detected in the system, depending on pH. At lower ligand concentrations (c HL = 0.0015 mol/l), the solution contains both dimers and monomers of this compound. The higher dentate number of HL compared to 2-alkylaminomethylphenols allows it to form more number of both mono- and binuclear complexes ([Cu(HL)] 2+, [Cu(HL) 2] 2+, [CuL 2], [CuL 2OH] -, [Cu 2(HL) 2] 4+, and [Cu 2(HL) 2L 2] 2+), making them more stable.

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