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Speciation of Some Divalent Essential Metal Ion Complexes with Bidentate Ligand in Low Dielectric Media

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ABSTRACT

Chemical speciation of binary complexes of Co(II), Ni(II) and Cu(II) with ethylenediamine was studied pH-metrically in the concentrations range of 0-60% v/v DMSO-water mixtures maintaining an ionic strength of 0.16 mol L^{-1} at 303K. Alkalimetric titrations were carried out in different relative concentrations of metal and ethylenediamine. Stability constants of various models of binary complexes were refined with MINIQUAD75. The best-fit chemical models were selected based on statistical parameters and residual analysis. The species detected are ML, ML_2, and ML_3 for all the metals studied. The chemical speciation, metal bioavailability and transportation are explained based on the distribution diagrams drawn using HYSS HYPERQUAD.

Keywords: Binary Complexes, Stability constants, Ethylenediamine, DMSO.