Potentiometry, Effect of Solvent and Thermodynamics of Novel Carbohydrazone and Its Transition Metal(II) Complexes

Ahmed A. El-Sherif^{1,*}, Elbastweesy R Elbastweesy², Gaber M. Abu El-Reash², Mutlaq S. Aljahdali³

¹Department of Chemistry, Faculty of Science, Cairo University, Cairo, Egypt.

²Department of Chemistry, Faculty of Science, Mansoura University, Mansoura,

³ Egypt Department of Chemistry, Faculty of Science, King Abd AlAziz University, Jeddah, Kingdom of Saudi Arabia.

*E-mail: aelsherif72@yahoo.com

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The ligand (2E,2'E)-2,2'-(carbonylbis(hydrazine-2-yl-1-ylidene))dipropionic acid (CBHP) had been synthesized and characterized using different tools of analysis. Protonation constants of the novel (2E,2'E)-2,2'-(carbonylbis(hydrazine-2-yl-1-ylidene))dipropionic acid (CBHP) ligand and its corresponding metal-CBHP stability constants with Cu(II), Ni(II), Co(II) and Zn(II) ions were measured in aqueous solution at ionic strength (I) of 0.1 mol.dm⁻³ NaNO₃. The order of stability for the formed complexes with reference to the metal ions complies with this order Cu(II) > Ni(II) > Co(II) > Zn(II) in harmony with the Irving-Williams stability order. The speciation of different species in solution has been assessed as a function of pH. The thermodynamic parameters were calculated and discussed. The effect of solvent on the protonation equilibria of the ligand was also discussed.

Keywords: Carbohydrazone; Complex; speciation; Thermodynamics; Nickel, Potentiometry.

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