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Original Research Article

Complex Formation of Bis(salicylidene)ethylenediamine (Salen type ligand) with Cupper(II) Ions in Different Solvents: Spectrophotometric and Conductometric Study

Khaled Muftah Elsherif^{1*}, Ahmed Zubi², Hana Bashir Shawish², Salima Abdallah Abajja², and Eman Bashir M. Almelah²

^{11*}Chemistry Department, Faculty of Science, University of Benghazi, Benghazi-Libya

²Chemistry Department, Faculty of Science, Misurata University, Misurata-Libya

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ABSTRACT

The complexation reaction between salen (Bis(salicylidene)ethylenediamine) and Cu(II) cations in methanol (MeOH), 2-propanol (2-PrOH), acetonitrile (AN), tetrahydrofuran (THF), and chloroform (CHCl₃) as nonaqueous solvents at 25° C has been investigated. The stoichiometry and formation constants of complexes have been determined spectrophotometrically and conductometrically by method of continuous variations and mole ratio method. The stoichiometry of Cu(II)-salen complexes in all solvents were 1:1 (ML) type using the two methods. By method of continuous variation, chloroform > 2-propanol > methanol ~ acetonitrile ~ tetrahydrofuran. However, by mole ratio method, the order of stability was as follows: chloroform ~ tetrahydrofuran > 2-propanol > methanol ~ acetonitrile. The resulting average of pK_f values in each solvent using the two spectrophotometric methods was as follows: 7.40, 6.89, 6.8, 6.22, and 6.18 for chloroform, 2-propanol, tetrahydrofuran, acetonitrile, and methanol, respectively. The Cu(II) cation formed a more stable complex with salen in chloroform. However, the less stable complex was in methanol.

Keywords: Copper, Conductometry, Salen, Schiff base, Spectrophotometry.

*Corresponding author Tel.: +218 (92) 3920803

*E-mail: elsherif27@yahoo.com