



Synthesis, Spectral and in Vitro Antimicrobial Studies of Cu(II) Complex of 2'-Hydroxy-4'-Methoxyacetophenoneoxime (HMAOX)

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ABSTRACT

*Cu(II) complex of 2'-hydroxy-4'-methoxyacetophenoneoxime (HMAOX) was synthesized from paeonol oxime by using standard protocol, and characterized by elemental analyses, melting point determination and spectral data. The ML_2 (metal/ligand) stoichiometry of the complex was determined by spectrophotometric and potentiometric studies, and mass spectral data. The value of stability constant of the complex was found to be 3.93×10^8 while its standard free energy of formation is 11.755 kcal/mol at 27°C. Beer's law is obeyed in the concentration range 4-100 ppm of Cu. The value of molar extinction coefficient and sensitivity as per Sandell's scale were found to be $3.20 \times 10^2 \text{ L.mol}^{-1}\text{cm}^{-1}$ and $0.198 \mu\text{g Cu cm}^{-2}$ respectively. The value of E° and A (the Arrhenius constant) were found to be $55.718 \times 10^3 \text{ J mol}^{-1}$ while its intercept gives the value of A (the Arrhenius constant) as 5.624×10^3 . The IR studies reveal that the phenolic proton is lost on complexation and the oxygen of the phenolic ($-\text{OH}$) and nitrogen of the oximino ($=\text{NOH}$) groups coordinate with Cu(II) ion. The electronic spectra and magnetic susceptibility measurement indicate that the complex is paramagnetic and tetrahedral in nature. The antimicrobial activity of different concentrations of ligand and its Cu(II)-complex has been evaluated against *Aspergillus niger*, *Aspergillus flavus*, *Aspergillus nidulans* and *Alternaria alternate* fungi and *Staphylococcus*, *Streptoproteus*, *Staph* and *Escherchia coli* bacteria. The results indicated that the ligand (HMAOX) and its Cu(II) complex have good anti-microbial properties as compared to the standard drugs (fluconazole and ciprofloxacin). The activity index (AI) for the bioactivity was also derived.*

Keywords: Cu(II)-complex, Spectra, Thermodynamic parameters, Antimicrobial screening.