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# Synthesis, Characterization and Biological Studies of Copper(II) Complexes of 2-(Piperidin-4-ylmethyl) isoindoline-1,3-dione

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**Abstract :** A new Mannich base, 2-(piperidin-4-ylmethyl)isoindoline-1,3-dione (L), formed by the condensation of piperidine, formaldehyde and phthalimide, and its Cu(II) complexes have been synthesized. Their structures have been elucidated on the basis of elemental analysis, molar conductance, IR, UV-visible, mass,  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR, EPR, magnetic, thermal and electrochemical studies. The complexes exhibit octahedral or tetrahedral geometry. Infrared spectral data show that the organic ligand is bidentate, binding through one of the two carbonyl oxygen atoms of the phthalimide moiety and the piperidine ring nitrogen and also the existence of coordinated water molecules. The X band EPR spectra of Cu(II) complexes in DMSO at room temperature were recorded and their salient features are reported. The electrochemical behaviour of Cu(II) chloro complex indicates that there exists Cu(II)/Cu(I) redox couple and that the organic ligand can stabilize the unusual oxidation state of Cu(I). Thermal data of some of the compounds show that the thermal decompositions take place mostly in two steps to produce metal oxides as final residues. Antimicrobial activities of the newly synthesized compounds were also investigated.

**Keywords:** Mannich base, thermal analysis, electrochemical behaviour, biological studies.

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