



**Electrochemical and Spectral Behavior of Binary and Mixed Ligand Copper (II) Complexes involving 3,4-Pyridinedicarboxylic Acid and Diimines in Dimethylsulfoxide**

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**ABSTRACT**

*The Electrochemical studies of binary copper(II) complexes with 3,4-pyridinedicarboxylic acid (3,4-pdc) in 1:1 A; 2:1 B; and 3:1 C; metal to ligand molar ratios and seven mixed-ligand copper(II) complexes of 3,4-pyridinedicarboxylic acid and diimines [Cu(3,4-pdc)(diimine)], where diimines= bipy 1; 4,4'-Me<sub>2</sub>bipy 2; 5,5'-Me<sub>2</sub>bipy 3; phen 4; dmp 5, bathophen 6; and bathocuproin 7 were made in 3:1:1 metal-to-ligand molar ratio in dimethylsulfoxide (DMSO) containing 0.2M sodium perchlorate (NaClO<sub>4</sub>) as the supporting electrolyte at a glassy carbon disc working electrode using cyclic voltammetry. It should be mentioned that in all binary complex solutions a single quasireversible redox couple (Cu<sup>2+/+</sup>) was obtained with formal potential E<sup>0'</sup> nearly at +80 mV vs Ag/Ag Cl at a scan rate of 25 mV s<sup>-1</sup>. On the other hand the mixed ligand systems involving bipy, 4,4'-Me<sub>2</sub>bipy, 5,5'-Me<sub>2</sub>bipy, phen and bathophen showed a single quasireversible redox couple while those involving dmp and bathocuproin displayed one irreversible redox process and a second quasireversible couple at 25 mV s<sup>-1</sup>. The UV-visible electronic spectra and the X-band EPR spectra of the above copper (II) complexes were studied in DMSO at room temperature and liquid nitrogen temperature respectively.*

**Keywords:** Cu (II) complexes, cyclic voltammetry, UV-visible spectra, EPR spectra.

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