VOLTAMMETRIC DETERMINATION OF ONN- COMPLEXES OF DIOXOMOLYBDENUM(VI) WITH SOME BENZOPHENONE N-PHENYL THIOSEMICARBAZONES

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Molybdenum compounds have various catalytic activities in biological processes; molybdenum cofactor is an essential component of various enzymes such as nitrogenase, sulfite and xanthine oxidizes and some molybdenum compounds catalyze oxygen atom transfer mechanisms [1]. Thiosemicarbazones ligands have raised considerable interest in molydenum chemistry because their [MoO₂L] complexes have a coordination site that is suitable for substrate binding [2].

To investigate the electrochemical behaviors of the thiosemicarbazone complex in the composition [MoO₂(L)D], a new dioxomolybdenum (VI) complexes, (L: 5-Chloro-4-methyl-2-hydroxybenzophenone-S-methyl-N-phenyl-thiosemicarbazone; D: γ-Picoline), was synthesized and characterized by elemental analysis, electronic, IR and ¹H-NMR spectra.

Cyclic and square wave voltammetric measurements were carried out with a Gamry Reference 600 potentiostat/galvanostat utilizing a three-electrode configuration at 25°C. For these measurements, glassy carbon was used as a working electrode. The surface of the working electrode was polished with alumina suspension before each run. Tetrabutylammonium perchlorate (Bu₄NClO₄, TBAP) in dichloromethane (DCM) was employed as the supporting electrolyte at a concentration of 0.1 M. High purity N₂ was used to remove dissolved O₂ at least 10 min prior to each run maintain a nitrogen-blanket during the measurements.

This work presents the assignments of the redox couples and the electrochemical parameters, which included the half-wave peak potentials (E½), anodic to cathodic peak potential separation (ΔEₚ), and ratio of the anodic to cathodic peak currents (Ipa/Ipc). E½ values obtained in this study are in agreement with the reported data for redox processes in similar O–N–S complexes in the literature [3-5].

References