

Synthesis, characterization, crystal structure and electrochemical behavior of a nickel (II) complex of 5, 6-dihydro-2H-pyran-3-aldehyde thiosemicarbazone

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Description

A new Ni^{II} complex of 5,6-dihydro-2H-pyran-3-aldehyde thiosemicarbazone (HDPTSC) has been synthesized and characterized by microanalyses, magnetic susceptibility, molar conductance measurements and by spectral methods (i.r., u.v.–vis., ¹H-n.m.r.). The structure of [Ni(DPTSC)₂] · B DMF has been solved using X-ray diffraction and found to be highly symmetrical with a *trans*-arrangement of the two bidentate ligands. The thiosemicarbazone coordinates as an anionic ligand *via* the thiosemicarbazone moiety's azomethine nitrogen and thiolate sulfur [on loss of the N₂ hydrogen]. The electrochemical behavior of the ligand and its Ni^{II} complex, determined by cyclic voltammetry, shows that the redox process of the ligand was highly irreversible, whereas the redox process of the Ni^{II} complex was observed as a one electron transfer process in a quasi-reversible and diffusion-controlled reaction.