

Nickel (II) Palladium (II) and Platinum (II) complexes of N-phenyl-N'-(4'-methylthiazol-2'-yl)-thiourea: Synthesis and characterization

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The new bifunctional ligand N-phenyl-N'-(4'-methylthiazol-2'-yl)-thiourea (PhMeTzTu) containing the thiourea and the thiazol functions. The ligand and its Nickel (II) Platinum (II) and Palladium (II) complexes were synthesized and characterized by elemental analyses, molar conductivities, magnetic susceptibilities, IR, UV- vis, ¹H, ¹³C NMR and mass spectra. The IR spectra and The ¹H, ¹³C NMR indicate that the ligand behaves as neutral monodentate or bidentate towards Ni(II)), Pd(II) and Pt(II) and coordinates via thione-S and thiazol-N.

Introduction: Important properties of thiourea to biological systems and some of their derivatives can regulate many pharmacological activities due to which they are important in medicinal chemistry. Thiourea and its derivatives are useful as antioxidants, fungicides, herbicides, antibacterial. Thiazole is compound has a stable heterocyclic, ring at various positions led to the synthesis of a variety of novel compounds with a wide spectrum of pharmacological activities such as antibacterial, antifungal, anti-inflammatory, anti-HIV, antitumor, anticonvulsant.

Experimental: We prepared ligand by mixing 1:1 molar ratio of 2-amino-4-methylthiazol (0.01mol) and phenyl isothiocyanate (0.01mol), complexes by mixing 1:1 and 1:2 molar ratio of metals to ligand respectively.

Infrared Spectra: IR spectrum of the ligand displays two bands at 3340cm⁻¹ and 3165cm⁻¹, attributable to $\nu(\text{N1-H})$, $\nu(\text{N2-H})$, respectively. The bands at 1195 and 650cm⁻¹ was displays which attributable to $\nu(\text{C=S})$ and (S1=thiazole ring) and $\nu(\text{CS1}) + \delta(\text{N2-H})$, respectively. ¹H,¹³C NMR spectra: ¹H NMR all prepared compounds showed an N2H proton signal while the N1H proton disappears. This indicates that (HL) may be coordinated with metal ions by removing the N1H proton. The ¹³C NMR spectra were revealed that the signals of all carbon atoms of the compounds.

Electronic Spectra and Magnetic Behavior: [NiL12] complex showed two bands at 16,000 and 21,000 which are characteristic for square-planar. Pd(II) and Pt(II) complexes showed a broad absorption band at $\lambda_{\text{max}}=330$ nm and its end extends up to approximately 550nm, obscuring the weak d-d transition. This is a predominant phenomenon in the square-planar Pd(II) and Pt(II) complexes containing sulfur as a donor atom.

Conclusions: The results proved that ligand (PhMeTzTu) acts as bidentate coordinating of endocyclic-N and thiourea-S atoms to the metals. A square planar geometry in case of all complexes.

Biography

Suhair Mansour Jambi, has completed her PhD at 2011 from King Abdulaziz University in Saudia Arabia in Jeddah. She is interested in modern technologies in the field of metallic complexes, the structure of metal complexes using modern methods, thiourea complexes and their use in the treatment of some microbes and some diseases such as cancer, e-learning and the use of modern technologies. She had published more than 10 papers in a reputed journal such as Journal of Molecular Liquids, Z Kristallogr NCS, Journal of Molecular Structure, Journal of Sulfur Chemistry. Now she is work at the University of Jeddah.

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