

Coordination Behavior, Theoretical Studies, and Biological Activity of Some Transition Metal Complexes with Oxime Ligands

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Abstract : The aim of this work is to synthesize, characterize and evaluate the biological activity of two Ligands : glyoxime and dimethylglyoxime, and their metal Ni(II) chelates. The newly chelates were characterized by elemental analysis, IR, EPR, nuclear magnetic resonances (^1H and ^{13}C), and biological activity. The antibacterial and antifungal activities of the ligands and its metal complexes were screened against bacterial species (*Staphylococcus aureus*, *Bacillus subtilis*, and *Escherichia coli*) and fungi (*Candida albicans*). Ampicillin and amphotericin were used as references for antibacterial and antifungal studies. The activity data show that the metal complexes have a promising biological activity comparable with parent free ligand against bacterial and fungal species. A structural, energetic, and electronic theoretical study was carried out using the DFT method, with the functional B3LYP and the gaussian program 09. A complete optimization of geometries was made, followed by a calculation of the frequencies of the normal modes of vibration. The UV spectrum was also interpreted. The theoretical results were compared with the experimental data.

Keywords : glyoxime, dimethylglyoxime, nickel, antibacterial activity

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