

Synthesis, characterization and antibacterial activities of 1H-imidazo [5, 6-f][1, 10] phenanthroline-2(3H)-thione and its Ni (II) and Cu (II) complexes

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ABSTRACT

As multi drug resistant pathogens are emerging, the search for novel potent drug candidate is ever going. Heterocycles are known by their broad spectrum of biological activities so a search for new drug from heterocycles can elevate the chance of success. The aim of this study was to obtain novel potent antimicrobial compounds. In line with this, 1H-imidazo [5, 6-f] [1, 10] phenanthroline-2(3H)-thione and its complexes (Ni (II) & Cu (II)) were synthesized, characterized and evaluated against bacterial strains. The compounds were characterized by elemental analyses (C, H, N and S), FT-IR, ^{1}H-NMR, ^{13}C-NMR, AAS, UV-Vis spectra and molar conductivity measurement. The results showed that ligand is bidentate and the molar conductivity measurement indicates that complexes are electrolytic. Electronic spectral study showed octahedral and distorted octahedral geometry for Ni (II) and Cu (II) complex respectively. The ligand and its complexes were screened against four bacterial strains using disk diffusion method. The result reveals that Ni (II) complex shows more bioactivity than Gentamicin against *Staphylococcus aureus*, *Escherichia coli*) while Cu (II) complex is more active than Ni (II) complex against *Bacillus subtilis.* Both Cu (II) and Ni (II) complexes exhibit higher antibacterial activities than the free ligand.

Keywords: Heterocycles, 1, 10-Phenanthroline, Complexes, Antibacterial activity.

Biography

Mr. Tilahun Wubalem Tsega has recieved his Bachlor degree in Chemistry in 2011 and his M.Sc in Inorganic Chemistry in 2014 from Haramaya University under supervision of Professor Upadhay (D.Sc) and has been working as Lecturer at Jimma University for the last five years. He is an emerging young researcher and has two papers on Shiff base derivative compounds and their microbial application in reputed journals. Now he is first year PhD fellow at Taiwan international grduate programme (TIGP), Academinia Sinica with partener University of National Chiao Tung.

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