

## The effect of bpy/phen on the structure, thermal stability and biological studies of some primary amine Ni(II) dithiocarbamate complexes

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The quest for new and effective compounds with pharmacological potentials can never be exhausted as there continues to be the outbreak of new infectious diseases, new strains and drug resistance of the old ones are also becoming concurrently rampant. Production of new antibiotics, anti inflammatory and anti-coagulants are therefore necessary for the treatment and prevention of the spread of these micro-organisms.

Bipyridine(bpy) and phenanthroline(phen) are N donor atoms which can form complexes with almost all the metals in the periodic table. They are  $\pi$ - deficient and so are good  $\pi$ - acceptors with their complexes stabilized by back bonding into the  $\pi^*$  orbitals of the N ring. They are often incorporated into many bridging ligands as classical bidentate chelating heterocyclic ligand to impart significant effects on the properties of their metal complexes. They can expand the coordination numbers of metal dithiocarbamate complexes through the interaction of metal complexes with various ligating Lewis bases. When combined with dithiocarbamates, the adducts formation is influenced through the mesomeric effect of their  $-NR_2$  group which help to impart better physical properties and enhanced biological activities because of their resemblance with biomolecules. Dithiocarbamates have proven to be relevant in the synthesis of new supramolecular structural compounds because of their unique properties to stabilize both high and low oxidation states in transition metals, such as to allow manipulations on their bonding and electronic properties through the incorporation of different functionalities on their nitrogen atom. This has made their complexes to be widely studied because of the rich and varied chemistry with diverse applications. Nickel plays an important role in the biochemistry of organisms, since it is part of the active center of enzymes, its pharmacological activities can be enhanced when bound to dithiocarbamate ligands through reaction of the dithiocarbamate with thiol groups. Nickel complexes are capable of existing in higher coordination numbers which is achieved in the present case by adducts formation with available ligands. They easily form adducts with nitrogen, oxygen, phosphorus and sulphur donors and the adduct formation lead to reduction in the original polymeric structures to monomeric adducts.

Primary amine complexes, the homoleptic compounds of phenyl and substituted phenyl dithiocarbamate ligands of group 10 triads have been produced. To study further the effect of coordinating, flexibility and easy kinetic tuning on the properties of this class of compounds, N donor atoms; 2, 2-bypiridine and 1, 10-phenanthroline have been incorporated into their ligand framework and utilizing the advantage of the free Proton from the NH site which can promote the lipophilicity of the compounds for more active biological

properties. The spectral and thermal analyses show the influence of the positive inductive effect of the methyl and ethyl substituents on the phenyl group on the dithiocarbamate. The effect of the N donor atoms of the bipyridine and phenanthroline on the parent complexes also reflected with enhanced antimicrobial and anticancer properties.

### **Biography**

Felicia Bobinihi is a senior Lecturer at the Federal College of Education, Okene, Nigeria. She completed her PhD degree at the North West University, South Africa. She is working on inorganic synthesis for biological applications and material synthesis, their processing and applications in various fields. Some of her works have been published in international peer review journals.

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**Received:** May 30, 2022; **Accepted:** June 02, 2022; **Published:** July 11, 2022

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