

## Acetophenone derived Schiff base and its Fe (III) complex: Synthesis, characterization and biological activity

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Schiff bases are adaptable substances that may be used to create ternary complexes. A test has been conducted to develop an entirely novel Fe(III) compound. In this instance, L-valine served as the secondary ligand, and the primary ligand or Schiff base is made by a condensation reaction between 4-methyl acetophenone and hydroxylamine hydrochloride. Condensation of primary and secondary ligands with iron salt produces a significant complex. The traditional reflux technique has been used to carry out the reaction. The newly created ligand has strong antibacterial efficacy against particular bacterial and fungal species. Researchers may have a big chance here, and one special area of study that will receive future attention is the utilization of biological applications of new molecules that have been synthesized. The medical and pharmaceutical industries benefit greatly from the biological variety of acetophenone derivatives. Valine amino acids also have antibacterial and antifungal properties in addition to these molecules. Elemental analysis, molecular weight estimation, magnetic moment measurement, melting point measurement, spectrum analysis (IR, UV-Vis,  $^1\text{H}$  NMR, mass spectrometry, etc.), and X-ray diffraction have been used to characterize the synthesized ligand and complex. The complex that is created is non-electrolytic and paramagnetic. The octahedral geometry of the complexes is suggested by the UV-Vis, FTIR,  $^1\text{H}$  NMR, and mass spectra. Further testing of the synthesized chemicals in biological research against certain bacterial and fungal strains has been carried out. According to the present research, most complexes have been shown to have stronger antibacterial action than ligands. A similar case of the Schiff base complex of Fe(III) has also been studied by some scientists. They have synthesized the monodentate Schiff base and prepared the iron (III) complex by using a similar approach.

**Keywords:** 4-Methyl acetophenone, Hydroxylamine hydrochloride, Schiff bases, L-Valine, Antibacterial, Antifungal