EXPLORING THE ANTIFUNGAL POTENTIAL OF Co(II) AND Mn(II) SCHIFF BASE DERIVED FROM o-AMINOPHENOL AND BENZALDEHYDE COMPLEXES, SYNTHESIS, SPECTROSCOPIC STUDIES

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Introduction

Schiff bases are important organic ligands capable of forming stable metal complexes with diverse biological activities. Mn(II) and Co(II) Schiff base complexes have shown strong antifungal potential. This study focuses on synthesizing, characterizing, and evaluating the antifungal activity of a Schiff base derived from o-aminophenol and benzaldehyde.

OBJECTIVE

Synthesize, characterize, and evaluate Mn(II) and Co(II) Schiff complexes.

METHODOLOGY

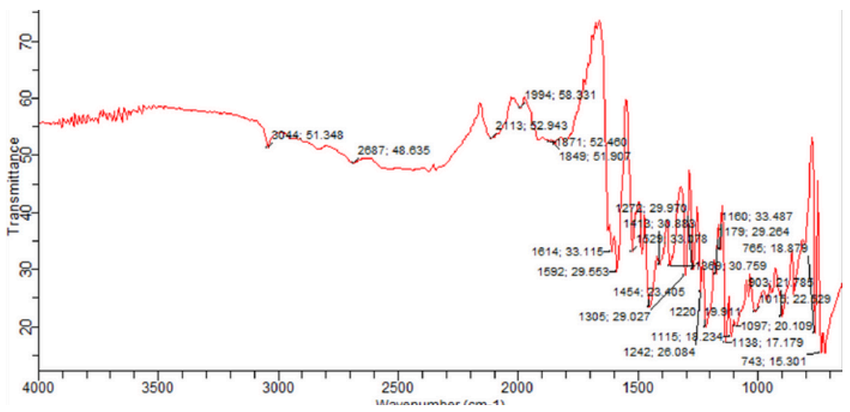
The Schiff base and Mn(II) and Co(II) complexes were synthesized via equimolar methanolic reflux. The compounds were characterized using spectroscopic and analytical techniques and assessed their antibacterial and antifungal activity through the agar diffusion method.

RESULTS

The Schiff base and its Mn(II) and Co(II) complexes were successfully synthesized and characterized. IR spectroscopy confirmed azomethine coordination, thermal analysis showed high decomposition temperatures, and magnetic studies indicated paramagnetic behavior. The complexes exhibited significant antibacterial and strong antifungal activity, particularly at higher concentrations, with moderate cytotoxicity. The metal-to-ligand ratio was determined as 1:2, confirming the Schiff base acts as a bidentate ligand.

Analysis

Spectroscopic and analytical data confirmed successful coordination of Mn(II) and Co(II) with the Schiff base via the azomethine nitrogen. Thermal and magnetic studies indicated stable, paramagnetic complexes. Biological evaluation revealed that metal complexation enhanced antifungal and antibacterial activities compared to the free ligand. Cytotoxicity results suggest moderate safety for potential bioactive applications. Overall, the data demonstrate that these Schiff base metal complexes are promising antimicrobial agents.



FTIR for the Schiff Base

Conclusion

Mn(II) and Co(II) Schiff base complexes were successfully synthesized and characterized. The complexes exhibited enhanced antibacterial and antifungal activities compared to the free ligand, with moderate cytotoxicity. These findings highlight their potential as effective bioactive agents, particularly for antifungal applications.