ISSN: 2320-5407
International Journal of Advanced Research
Publisher's Name: Jana Publication and Research LLP
www.journalijar.com

REVIEWER'S REPORT

Manuscript No.: **IJAR-52785** Date: 14-07-2025

Title: MICROWAVE SYNTHESIS, SPECTRAL AND ANTIMICROBIAL STUDIES OF SOME SCHIFF BASE METAL COMPLEXES

Recommendation:
Accept as it is .....
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality			✓	
Techn. Quality			✓	
Clarity			✓	
Significance			✓	

Reviewer Name: Mir Tanveer

Reviewer's Comment for Publication.

1. Relevance and Scientific Value:
The manuscript addresses an important intersection of synthetic inorganic chemistry, green chemistry, and bioinorganic applications. The use of microwave-assisted synthesis aligns well with the current trends in eco-friendly chemical methodologies. The integration of spectral, thermal, and biological investigations adds depth and multidisciplinary relevance to the work.

2. Abstract:
The abstract effectively summarizes the scope, methods, and key findings of the study. It highlights the comparative synthesis approaches (microwave vs. conventional), the analytical characterization of the Schiff base metal complexes, and their antimicrobial efficacy. The mention of improved antimicrobial activity in metal complexes over free ligands provides a clear outcome. The abstract is concise, coherent, and informative.

3. Introduction:
The introduction provides a well-grounded background, justifying the significance of Schiff bases and the choice of vanadium complexes. The biochemical relevance of vanadium and the catalytic value of Schiff base-metal complexes are well emphasized. The description of Schiff base ligand versatility and the rationale for studying their complexes in terms of structure, reactivity, and biological activity is both logical and compelling.

4. Methodological Rigor:
The synthesis of metal complexes using both conventional and microwave-assisted routes reflects a thoughtful comparative strategy. The use of multiple characterization techniques—elemental analysis,

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FT-IR, FAB-mass, ESR, thermal analysis, and electrical conductivity—demonstrates a comprehensive analytical approach. This multifaceted methodology strengthens the reliability of the structural and functional interpretations.

5. Spectral and Thermal Characterization:
The spectral studies (FT-IR, FAB-mass, ESR) are appropriately selected for confirming the coordination and degradation patterns of the metal complexes. The thermal decomposition steps, particularly the observation of hydrated complex behavior, are relevant for understanding compound stability and structural features.

6. Electrical Conductivity:
The evaluation of solid-state electrical conductivity is a valuable addition, offering insight into the semiconducting nature of the synthesized complexes. This interdisciplinary aspect may interest researchers beyond synthetic chemistry, including those in materials science and electronics.

7. Antimicrobial Studies:
The assessment of antibacterial and antifungal activities against selected microorganisms (E. coli, S. aureus, S. fecalis, A. niger, T. polysporum) is a significant aspect of the study. The comparative data highlighting enhanced activity in metal complexes over free ligands underscores the therapeutic potential of the synthesized compounds.

8. Language and Presentation:
The language is clear, scientific, and appropriately technical. Terminologies are used accurately, and the structure of the manuscript promotes readability and logical flow. The manuscript maintains academic rigor throughout.

Conclusion:
This study presents a well-conducted and analytically robust investigation into Schiff base metal complexes synthesized via microwave and conventional routes. The characterization and antimicrobial assessments are thorough and well-articulated. The integration of green synthesis, structural analysis, and biological activity renders this work a valuable contribution to the fields of coordination chemistry, bioinorganic chemistry, and pharmaceutical chemistry.