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Synthesis of transition metal complexes containing thiosemicarbazone ligand and their biological activity

Kulsum Hashmi[1], Satya Satya[1], Sakshi Gupta[1], Priya Mishra[1],Tahmeena Khan[2], SeemaJoshi[1].

•*[1] Department of Chemistry, Isabella Thoburn College, Lucknow- 226007, Uttar Pradesh, India*

•*[2] Department of Chemistry, Integral University, Lucknow - 226026, Uttar Pradesh, India*

•*Corresponding email: sjoshiitc@gmail.com*

INTRODUCTION

- In the field of medicinal chemistry and drug development, metals have shown to be very beneficial.
- Transition metals and their complexes plays an important role in materials chemistry and metal catalysis. These metals are crucial in medicine and pharmaceutical sciences due to their coordination, redox and catalytic properties.
- Thiosemicarbazone (TSC) are one of the important Schiff base ligand formed by the condensation of aldehyde or ketone and thiosemicarbazide [1].

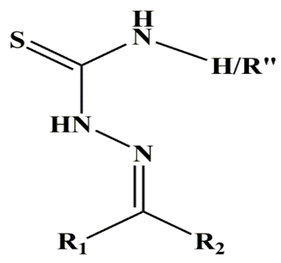


Fig. 1. General structure of TSC ligand

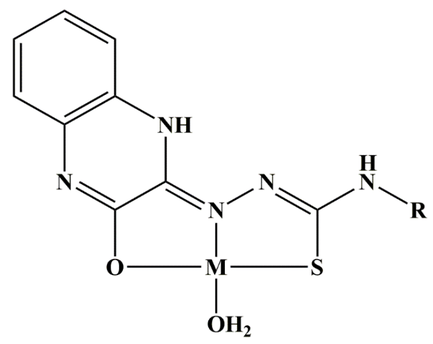
METHODOLOGY

The literature for review was examined and taken from prominent indexing databases over the past decade to investigate the synthesis of transition metal complexes with thiosemicarbazone ligands.

Biological Applications of TSC-Metal complexes

❖ Antidiabetic Activity

Zn and Cu complexes with quinoxaline–TSC ligands were reported and exhibited antidiabetic activity [2].



M= Zn, Cu

Fig. 2. Quinoxaline–TSC ligand

❖ Anticancer Activity

Cd with 4-benzyloxy-benzaldehyde-4-methyl-3-thiosemicarbazone (BBMTSC) were also reported and exhibited anticancer activity [3].

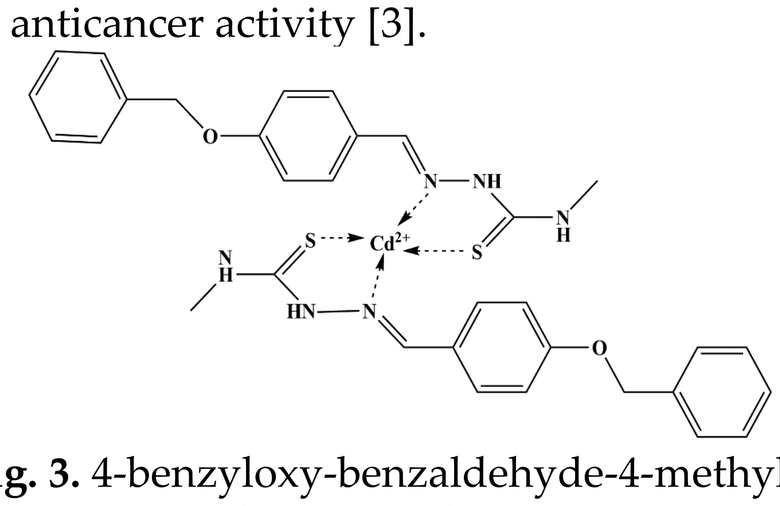


Fig. 3. 4-benzyloxy-benzaldehyde-4-methyl-3-thiosemicarbazone

S.No.	Metal	Ligand	Biological Activity	References
1.	Cu (II), Co (II), Ni (II), and Zn (II)	ethyl (E)-2-cyano-3-(2-((E)-3-ethyl-2-hydroxybenzylidene)hydrazine-1-carbothioamido)-3-(4- ethylphenyl)acrylate	Antifungal activity Antibacterial activity	[4]
2.	Cu (II)	α-Heterocyclic-N4 - Substituted TSCs	Antiproliferative activity	[5]
3.	Pd (II) and Pt (II)	3,5-diacetyl-1,2,4- triazol mono(4-phenylthiosemicarbazone)	Antiproliferative activity	[6]
4.	Ru (II)	(E)-2-(1-(5-substituted thiophen-2-yl)ethylidene)-N-substituted hydrazine-1-carbothioamide	Anticancer activity	[7]

CONCLUSION

Transition metal-TSC complexes open new opportunities for future interdisciplinary studies and research aimed at comprehending the biochemistry of these complexes.

FUTURE WORK / REFERENCES

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7. Subasi, et al. 2020, *Materials Science and Engineering: C*, 106, 110152.