

ANTIMICROBIAL STUDY OF SOME TRANSITION METAL COMPLEXES OF RHODANINE AND SALICYLADIMINE

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ABSTRACT

In this study, complexes of copper and zinc with rhodanine and salicyladimine were examined for their antimicrobial properties against selected bacteria species. The complexes were also characterized using infra-red and ultra-violet spectroscopy for structural elucidation and determination of electronic transitions occurring between the ligands and their complexes. All the complexes showed varied inhibition on the growth of the test organisms at different minimum inhibitory concentrations ranging from 0 – 25 mg/ml. The infra-red spectroscopy showed the presence of different functional groups like O-H stretching vibration at 3441cm^{-1} , C-H bending at 833.28cm^{-1} and 750.33cm^{-1} , C=C stretching vibration at 2360.95cm^{-1} in the salicyladimine ligand and N-H stretching vibration at 3448.84cm^{-1} in the complex formed with copper, whereas Rhodanine shows C=O at 1734cm^{-1} with copper acetate, 1708.99cm^{-1} with Zinc nitrate, C-H stretching at 3086.21cm^{-1} , 3074.63cm^{-1} with copper and 3174.94cm^{-1} with zinc. The ultraviolet spectroscopy showed absorptions assigned to different geometry. The complex of salicylaldimine showed two bands around 26385cm^{-1} and 42016cm^{-1} which are assigned to square planar geometry. Rhodanine showed four bands around 48780cm^{-1} , 33898cm^{-1} , 39525cm^{-1} corresponding to $n\rightarrow\pi^*$ transition and 26809cm^{-1} corresponding to $n\rightarrow\sigma^*$ transition. Rhodanine complex with zinc nitrate showed two bands around 23925cm^{-1} and 22411cm^{-1} assigned to charge transfer. Rhodanine complexed with copper acetate showed two bands around 20283cm^{-1} and 24096cm^{-1} which are assigned to square planar geometry. From the analysis of variance, there is no significant difference ($p\text{-value}= 0.05$) in the antibacterial activity and the selected pathogen. Based on this study, we recommend that metal complexes should be used to restrict the growth of bacteria in place of Ligands.

Keywords: Rhodanine, Salicyladimine, antimicrobial properties, Infrared and ultraviolet spectroscopy.