

SYNTHESIS, CHARACTERIZATION AND ANTIBACTERIAL ACTIVITIES OF FERROCENE LIGANDS AND THEIR BINUCLEAR COMPLEXES

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Abstract: 6-Chloro-2-ferrocenyl-1H-benzimidazole and (E)-((4-chloro-2-hydroxyphenylimino)methyl)ferrocene ligands and their Fe(III), Co(II), Cu(II), Zn(II) and Pd(II) complexes were synthesized. The structures of the new ligands and their complexes were confirmed on the basis of elemental analysis, FT-IR, ¹H-NMR, ¹³C-NMR, UV-Vis spectroscopy and mass spectrometry. In addition, magnetic moment and molar conductivity measurements were performed for the complexes. Fe(III), Cu(II), Zn(II) and Co(II) complexes are not electrolyte while Pd(II) complexes are electrolyte. All the complexes have 1:1 M:L ratio. The antibacterial activity of the ligands and the complexes were investigated against *Staphylococcus aureus* and *Escherichia coli*. It has been observed that the complexes generally show considerable high activity compared to the ligands, and this situation was much more pronounced in the complexes of benzimidazole compound, which do not have a chelate structure. The high activities of the Co complex of the benzimidazole ligand and the Zn complex of the Schiff base ligand against *Staphylococcus aureus* (2 and 4 mg/mL, respectively), are noteworthy.

Keywords: azomethine, binuclear complexes, organometallic, transition metal complexes, antibacterial.