CONCLUSION

In the present study, sulfa drug containing ligands were prepared. The ligands were proposed by simple condensation of tetrahydrophthalic anhydride and various sulfa drugs. Five simple ligands and one bis ligands were prepared and characterised on the basis of elemental analysis, spectral studies. thermogravimetric analysis and C, H, N, S-content. IR/NMR spectral features of all the ligands are almost identical with slight variation of group frequency and type of proton. The LC-MS data give the molecular mass peak for ligands. All these facts confirmed the structure of ligands. The thermogravimetric analysis of all the ligand support carboxylic group, which on thermal degradation eliminates CO_2 gas. Such degradation of ligand was shown in thermogram, which agree with theoretical value.

Metal complexes of Cu^{2+}, Ni^{2+}, Co^{2+}, Mn^{2+} and Zn^{2+}metal ions with each ligand were synthesized. All the metal complexes are insoluble in water and common organic solvents. All the metal complexes suggest that M:L ratio is 1:2 while that of metal complexes of bis ligand suggest M:L ratio is 1:1.

IR spectra of all the metal complexes of each series are almost identical in terms of all aspects, only discernible difference is observed in IR spectra of metal complexes. The broad band due to OH of COOH in the region 4000-2500 cm^{-1} was narrowing due to coordination bond formation of COOH with metal ion. However, the narrowing band may be due to coordinated water molecule. The new band due to M-O was observed. The band due to C=O group of COOH in the ligand is almost vanished and the new band due to COO^- anion appeared. These IR spectral features confirm the metal complexation.

Thermal degradation of all the metal complexes suggest that each complex degrade initially due to associated water. Then rapid degradation due to *in situ* acceleration by metal oxide formation during thermal degradation.

The magnetic moment and reflectance spectra of all the metal complexes suggest geometry of each type of ligand. The results suggested that $Cu^{2+}$and Ni^{2+} metal complexes have tetrahedral geometry and paramagnetic. The Co^{2+} and Mn^{2+} complexes have octahedral geometry and paramagnetic. As expected, Zn^{2+} metal complexes are diamagnetic.

The results of antimicrobial activity of all the ligands and their metal complexes indicated that all these compounds are more or less toxic against bacteria and fungi. The results show that the Cu^{2+} metal complexes are more toxic.

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