SUMMARY

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In the present report 92 schiff's bases and metal complexes have been synthesised, characterised and studied for their various applications. The number of Similarities are observed among these complexes and also there are some devi tions in their certain characteristics.

All the synthesised complexes have common feature, they exhibit a binuclear character with the general formula ($M_2L_2.4H_2O$). The structure is assigned on the basis of elemental analysis and magnetic studies. The environment around central metal atom is found to be octahedral which is further supported by magnetic and electronic spectral studies. X-ray diffraction shows a Tetragonal unit cell with different volumes and different number of molecules per unit cell. I.R. spectra shows common bands observed in most of the complexes.

The complexes slightly differ from each other in the evaluation of their applications. All the complexes possess good luminescence properties. The Luminescence intensity increases in the order Ni > Cu > Zn. The distance between two azomethine groups and aromatic character also have effect on luminescence intensity and the order is : hydrazone < m-Phenylenediamine, < p-Phenylenediamine < Benzidine and in case of Thiocarbohydrazone and Terephthaldehyde the order is : Thiocarbohydrazone > Terephthaldehyde.

All reported complexes are good pigments. The order of rubbing and light fastness depends upon the nature of the ligands and found to be as :

Benzidine $>$ p-Phenylenediamine $\simeq$ Terephthaldehyde $>$ m-Phenylenediamine $>$ Thiocarbohydrazone $>$ Hydrazone.

The synthesised ligands and their metal complexes possess good antibacterial activity though they are much less active compared to standard antibacterial agents. This property is found to be ligand and metal ion dependent. The order is found to be Ni $>$ Cu $>$ Zn which slightly differs from some reported work and may be due to the nature of ligand and gradual decrease in the size of the central metal atom.

More light can be thrown on structural elucidation by NMR, ESR studies and Extended Absorption X-ray fine structure (EXAFS). Magnetic moment studies at different temperatures would have helped to decide about binuclear nature of the complexes. The thermoluminescence would also have explained the fluorescence behaviour of the complexes properly.

Apart from the titled work some extra work is also done which has been accepted for presentation at the various international conferences. The work is on liquid crystal complexes. co-ordination polymers and macrocyclic compounds. The abstracts of this work are given in the "papers presented list".