Abstract:

Metal complexes of 8-hydroxyquinoline is guided by reaction condition and the types of the metal salt used. Three different types of zinc-oxyquinolate complexes were obtained upon using different solvent of reaction. Solvates of tetra nuclear zinc-oxyquinolate complex resulted when DMF or DMSO were solvent of reaction. These tetranuclear zinc-oxyquinolate complexes are porous in nature which reversibly absorbs moisture from atmosphere with change in the color of the complex upon absorption and desorption. A salt of tetrachloro zincate and hydroxyquinolium obtained when water was used as solvent of reaction and a molecular complex of two mono nuclear zinc-oxyquinolate on using 3-methyl pyridine as solvent of reaction. Reaction of 8-hydroxyquinoline with cobalt or manganese or lead in DMF also resulted in tetranuclear complexes of respective metal. While mercury was used in the reaction coordination polymer mercury-oxyquinolate was obtained. Furthermore, tetranuclear cobalt and manganese complexes act as building block for higher nuclearity metal complexes as respective decanuclear complexes were resulted when tetranuclear cobalt and manganese were further reacted with extra amount of respective metal salt. The tetranuclear cobalt, decanuclear cobalt and decanuclear show antiferromagnetism due to the coupling of neighboring metal centers.

Electron deficient cation in the salts of nitroso derivative of 8-hydroxyquinoline (5-(hydroxyimino)quinolin-8-one) with mineral acids allows favorable distance for anion-π interaction. In all the cases anions are sandwiched between cations. Among the chloride, bromide, pechlorate and nitrate anion later show shortest anion-π distance. Binding constants of nitrate salts of 5-(hydroxyimino)quinolin-8-one, 5-aminoquinoline, 4-hydroxyquinazoline and 8-hydroxyquinoline were compared. On comparison of these binding constants show that in solution anion-π interactions are too weak to show a distinction in binding constants due to large electrostatic interactions contributing to the salts. 5-(hydroxyimino)quinolin-8-one also interact with zinc or fluoride anion which results visible color change in its solution. These changes distinguish zinc or fluoride ions from other metal ions or anions. However, zinc ions enhance the emission while fluoride anions decrease the emission of the compound which enables them to distinguish from each other. The compound forms a mononuclear complex with zinc ion and a host-guest complex with fluoride ion. The color differences of zinc complex or host-guest

complex with fluoride anion and the color of parent compound enables them to differentiate in solid form as well.

Possibilities of partial bond rotation and the weak interaction of the functional group present in the remote site gave four polymorph of 4-Nitro-N-(quinolin-8-yl)benzamide on crystallization from different solvents as for example DMSO, methanol, DMF and DCM . Polymorphs have monotropic relationship as there were no solid state transformations between the polymorphs before their melting point. In the of sulphate ester, bromide and nitrate salts of 4-Nitro-N-(quinolin-8-yl)benzamide the torsion between its two planes depend on the bulkiness of the anion involved. The twist between the planes was highest in sulphate ester salt as it bulkier than the later two.

Salts or cocrystal of aminoquinoline derivative with hydroxyl aromatic acids show showed potent antimalarial activity with IC_{50} values in 6-20 µM magnitude. Among the samples studied for antimalarial activity, salts and cocrystal showed an enhancement in potency compared to their individual parent compounds, whereas the covalently linked compounds showed minimal activity. Salts or cocrystal showed comparable antimalarial activity with quinidine standard.

Tri-quinoline based receptors and zinc ions showed novel and unprecedented fluorescence emission properties. Presence or absence of substituents on the aromatic ring of the connecting part of a particular tri-quinoline receptor determines the exhibition of either single or dual fluorescence at different concentrations of zinc ions. Tri-quinoline based receptor showing a Stokes shift of a value higher than 200 nm and fluorescence emission spreading over a wide range of visible spectra at intermittent concentration of zinc ions Introduction of methyl group in the tethered *bis*-phenolate moiety enabled reversible binding of Cu^{2+} or Zn^{2+} ions and vice versa.