

ABSTRACT

Coordination compounds and supramolecular assemblies play an essential role in the chemical industry and life itself. Mixed-ligand complexes of Cobalt(II), Manganese(II) and Ni(II) etc with N-multi-dentate ligands, bipyridine, 2,4,6-trimethyl pyridine and pyridine-2,6-dicarboxylic acid in the presence of co-ligands like benzoic acid, maleic acid and sodium azide have been prepared and characterized by XRD, TGA, IR and UV-Vis spectrophotometer. Anti-oxidant and anti-bacterial activities were also studied. Hydrothermal (*in situ*) ligand synthesis and reflux method were successfully employed. Organometallic chemistry is one of the most challenging research fields in modern chemistry to design and synthesize multi-functional compounds and materials with predictable structures and desired magnetic, optical, fluorescent, therapeutic, anti-cancer properties.