

ABSTRACT

This research work elaborates manganese-based metal complexes with 4,4-Oxydianiline ligand. The metal complexes were formed by exploring different methods ranging from sonication to hydrothermal. The effect of different co-ligands, solvent, molar ratios and pH were studied in the synthesis of complexes. Two manganese metal complexes were formed by using pyridine-2,6-dicarboxylic acid and Sodium oxalate as a co-ligand. The synthesized metal complexes were characterized by different spectroscopic techniques. The UV-Visible, FTIR and photoluminescence analysis of metal complexes was investigated to ensure the formation of complexes. UV-Visible spectroscopy revealed that absorption maximum of metal complex-1 and metal complex-2 was 303.69nm and 294.80nm respectively whereas the lambda maximum of ligand was 261.83nm. There is a major shift in the λ_{max} values of complexes and ligand that indicated the formation of metal complex. The FTIR analysis of samples indicated that there is a major shift in the peak positions of complex as compared to the ligand that also supported the metal complex formation. The photo luminescence analysis of metal complexes was investigated in different solvents and acetonitrile was chosen as the best solvent with emission wavelength of 358 nm with an emission intensity of 801.94 au.. Different analytes were used for chemo sensing applications and the findings revealed that metal complex-1 has best selectivity towards 4-nitroaniline. These metal complexes have the potential to be used in the sensing applications against different explosives and organic pollutants.