

ABSTRACT

In present study, five coordination complexes of copper metal with pyromellitic acid ligand were synthesized by utilizing different synthetic strategies i.e. sonication, reflux and solvothermal techniques. In order to optimize the synthetic conditions of metal complexes, the choice of solvent, influence of co-ligand, pH, and molar proportions of metal and ligand were also investigated. The characterization and analysis of the metal complexes were done by FTIR, Photo-Luminescence and UV-Vis spectrophotometric methods. The photocatalytic activity of these metal complexes was also investigated by estimating the degradation pattern of methylene blue dye. The photocatalytic activity of the metal complexes was measured under sunlight and observations were compared in the presence and absence of external oxidant i.e. hydrogen peroxide. The results revealed that in the presence of an oxidant such as H_2O_2 , the photocatalytic properties of the metal complexes could be improved. The UV-Visible spectra obtained for the complexes and ligands were found to be different and exhibited different λ_{max} values. The substantial shift of some peaks of the free ligand and the synthesized metal complexes was revealed by FTIR spectra showing coordination.