

ABSTRACT

In this research work various coordination complexes of Ni metal with 1,2,4,5-Benzenetetracarboxylic acid ligand were synthesized by using different synthetic strategies ranging from sonication, reflux and solvothermal methodologies. Effect of co-ligand, choice of solvent, pH and molar ratios of the metal and ligand was also studied to optimize the synthetic conditions of the complexes. The synthesized coordination products were characterized by UV-Visible spectroscopy, FT-IR spectroscopy and Photo-Luminescence spectroscopy. Melting points and solubility of complexes in polar to nonpolar solvents were checked. The UV-Visible spectroscopic study was used to identify the possible electronic transitions of these complexes. The UV-Visible spectra obtained for the complexes and ligands were found to be different and exhibited different λ_{max} values. FTIR spectra revealed the significant position shifts of peaks between free ligand and the synthesized metal complexes. The photoluminescence analysis revealed the significant fluorescence of all the complexes. This fluorescent nature of compounds was further utilized to devise the chemosensing behaviour against numerous nitro aromatics and heavy metals.