

## Abstract

The research study is focusing on the synthesis of transition metal complexes of nickel metal with ligand 4,4-oxydianiline. The chloride, sulfate and nitrate salts of nickel metal with anhydrous and hydrous nature are used in this study to synthesize the metal complex of Ni-Oxydianiline. The complexes synthesized in different solvents using different techniques are characterized by using characterization techniques. The first complex is Ni-ODA-CA that contain Nickel chloride salt with 4,4-oxydianiline and Co-ligand Cinnamic Acid in solvent Acetonitrile. The FTIR spectra confirmed the change in peaks of primary amine from  $3300\text{ cm}^{-1}$  to functional group region compared with ligand's spectra. The UV-visible of this complex shows blue shift and photoluminescence shows specificity towards 4-Nitroaniline shows application in explosive detection. The second complex is Ni-ODA-BTCA containing Nickel Chloride salt with 4,4-Oxydianiline and co-ligand a Pyromellitic acid or benzene tetra carboxylic acid . The confirmation of compound by FTIR spectrum showing Carboxylate ion peak at  $1500\text{ cm}^{-1}$  and aromatic C=C stretching at  $1400\text{ cm}^{-1}$ . The UV-Visible spectra also show blue shift for this complex that is hypsochromic shift. The value of Stern Volmer constant for first sample AH4 is  $0.172 \times 10^{-3}\text{M}^{-1}$  second sample AH10 is  $0.476 \times 10^{-3}\text{M}^{-1}$ . The photoluminescence application of the complex shows effective results for potassium dichromate quencher that can be used to detect heavy metal ions in different substances.

**Keywords:** 4,4-Oxydianiline, Ni-Metal Complexes, Photoluminescence, Metal-Ligand Complex