

# ABSTRACT

In this research, cobalt based metal organic frameworks (MOFs) has been synthesized by reacting of 5-nitroisophthalic acid and pyridine-2,4,6-tricarboxylic acid along with the study of characterization and evaluation for fluorescence and electrochemical applications. Shifting of peaks in the FTIR spectrum and TGA shows the formation of complex. By using photoluminescence, after solvent selection series of nitroaromatics were detected. Complex-30 (Cobalt chloride, pyridine-2,4,6-tricarboxylic acid) and complex-45 (Cobalt chloride, Cadmium chloride, 5-nitroisophthalic acid, 4,4-diamino diphenyl methane) both shows remarkable emission intensity. The selective sensing of 4-nitrophenol and 4-nitrotoluene were observed for complex-30 and complex-45 respectively. Cyclic voltammetry of Complex-30 was investigated. At current density 0.3 A/g, it gives less charging time and greater discharging time about 190 seconds. By the process of electro-impedance, Nyquist plot was obtained and Faraday resistance was calculated as 1  $\Omega$ .