

Abstract:

Nickel metal-organic frameworks (Ni-MOFs) have garnered significant interest due to their versatile properties and potential applications in various fields. This study focuses on the synthesis and comprehensive characterization of a novel Ni-MOF derived from 5-sulphoisophthalic acid. In this research work, MOFs of nickel using salt (nickle chloride hexahydrate), ligand (5-sulphoisophthalic acid) and co-ligands (NH_3) namely complex 1 and 2 were synthesized using solvents (Distilled water, DMF, ethanol) through stirring and reflux method. Characterization techniques like FT-IR, Fluorescence spectroscopy and electrochemical analysis were used to study the electrochemical and luminescence applications of prepared MOFs. FTIR confirmed the formation of MOFs due to shifting of major peaks at lower frequency. The electrochemical behaviour of the Ni-MOF was investigated through cyclic voltammetry, revealing its potential as an electrode material for energy storage devices. Additionally, the luminescent properties of the Ni-MOF were explored, showcasing its ability to emit visible light under specific conditions. This study underscores the multifunctional nature of the Ni-MOF, demonstrating its promise for simultaneous electrochemical and luminescent applications.