



Abstract

A considerable upsurge in the field of Zirconium based organic-inorganic hybrid material is challenging because of their potential applications. The present work emphasized on the synthesis of coordination compounds of zirconium with 1, 3, 5-Tricarboxybenzene by using reflux, sonochemical and hydrothermal methods. These compounds were characterized by FT-IR spectroscopy, Elemental Analysis and UV-Vis Spectroscopy. On the basis of results obtained, the proposed structures of products were drawn that satisfied all the supportive information. Lambda maximum of the compounds was also determined and possible transitions along with shifts were identified. Furthermore, Photocatalytic activity of zirconium-based complexes was also explored and degradation behavior of compounds against an organic pollutant (methylene blue dye) in aqueous solution was studied. The results revealed an efficient degradation of methylene blue up to 65%. Luminescence properties of coordination compounds were also exploited and their potential of being efficient candidate as photo-luminescent sensor against explosive compounds was also studied. The compounds exhibited excellent quenching behavior i.e., 93.3% quenching against Picric acid and 53% quenching against Nitro Benzene.