ABSTRACT

In this research work, successful green synthesis of two complexes [$Ce(Pip)_2$(1,10-Phen).$3H_2O$] and [$Ce(Pip)_3$] has been achieved using 1,3-benzodioxole-5-carboxylic acid (HPip). The ligand had no hits with cerium in previously reported complexes. In the proposed structure for these two complexes, [$Ce(Pip)_3$] has octahedral (CN=6) geometry and [$Ce(HPip)_2$(1,10-Phen).$3H_2O$] has tricapped trigonal prismatic (CN=9). The post modification of these complexes is brought by using different dyes which has been resulted in formation of [$Ce(Pip)_3$]@MB] composite depicted from distinct crystal colour. Various analytical and spectroscopic analyses are performed to obtain molar absorptivity $\in$, quenching efficiency Q %, quenching constant K_q and quantum yield Φ values of [$Ce(Pip)_3$]@MB composite. Photoluminescence based sensing applications of composite are studied for various nitroaromatics and heavy metals. The data of these studies showed that [$Ce(Pip)_3$]@MB composite could be used as dual chemo sensor.