

Synthesis, characterization and thermal properties of two novel lanthanide 2,2'-biquinoline-4,4'-dicarboxylate complexes

Abstract

Two new lanthanide coordination complexes with 2,2'-biquinoline-4,4'-dicarboxylic acid (H₂bqda) and 1,10-phenanthroline (phen), [La₂(Hbqda)₂(bqda)₂(phen)]_n [1] and [Gd(bqda)_{1.5}(phen)]_n [2] were successfully synthesized and characterized. The complexes were obtained through hydrothermal method at 170°C for 3 days. The metal to acid to 1,10-phenanthroline ratio, 1:1:2 had been chosen to synthesize 1 and 2. The percentage yield for 1 and 2 was 68% and 75%, respectively calculated based on the starting lanthanide salt used. The yellow coloured complexes were found to be stable at room temperature and insoluble in organic solvents. The complexes obtained were characterized by elemental analysis (CHN), infrared spectroscopy (FTIR) and thermogravimetric (TGA) analysis. The FTIR spectra of these complexes confirm the complexation had taken place by the existence of COO⁻ symmetric and asymmetric stretching peaks at 1385 and 1542-1532 cm⁻¹, respectively