

Abstract

Lanthanides have very poor luminescence intensity because of their poor molar absorption coefficient and poor quantum yield. In order to have potential utility of lanthanide luminescence in the biological and electronic (optical light emitting diodes) fields the luminescence intensity of lanthanides must be enhanced and this is achieved via ligand sensitization. This process involves two steps: First the co-ordination of ligand to the lanthanides and finally energy transfer from the ligand to the lanthanides. Further enhancement is achieved by encapsulating the lanthanides in a protective sheath by some synergistic ligands thereby preventing quenching by water molecules. In recent years a new approach has been to make use of ionic liquids which provides the advantages of both sensitizers and synergistic ligands. The aim of this work is to enhance the luminescence of lanthanides using amino acids as sensitizers and to compare the level of sensitization achieved by phenylalanine, benzoic acid and phenylacetic acid. The study of Amino acid as sensitizer is required in order to investigate if amino acids can be used as a part of ionic liquid. Apart from this a kind of comparative study will give information on the effect of the spacer CH₂ group. The lanthanides being used was Eu⁺³. In order to obtain further enhancement the experiments were performed in presence of synergistic ligands like TOPO in a micellar medium. The experimental work was supported by some theoretical calculations to determine the reason behind the differences in the level of sensitization