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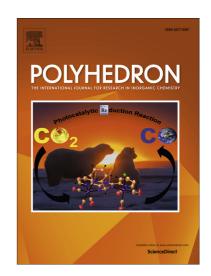
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Synthesis and characterization of lanthanide complexes with a pentadentate triazine-based ligand

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Abstract: A series of mononuclear [Ln(L)(H₂O)(NO₃)(solv)]·solv, (Ln = Pr (1), Nd (2), Sm (3), Eu (4), Gd (5), Tb (6-6a), Dy (7); solv = DMF, DMSO, H₂O) and L = 2,4-Bis(2-hydroxybenzylidenehydrazino)-6-methoxy-s-triazine complexes were prepared. The lanthanide(III) ions are nine-coordinated in the complexes and are bound to the O atoms of bidentate nitrate, three N and two O atoms of a pentadentate L ligand and one O atom from water and one O atom from dimethylformamide with a spherical capped square antiprism coordination environment in 1-7. The compounds have been characterized by means of elemental analysis, IR spectroscopy, UV-vis spectroscopy, X-ray diffraction, and thermal analysis. Lanthanide-centered emission of the complexes is overlapped by the ligand emission.

Keywords: Lanthanide complexes, Triazine ligands, X-ray structure, Optical properties

1. Introduction

The research on lanthanide(III) complexes have attracted attention in recent years due to their well-defined spectroscopic and magnetic properties [1-5]. The rare earth RE³⁺ ions are potential local luminescent probes for diagnostic application in biological systems [6-8]. RE³⁺ based compounds are highly promising building blocks for preparation of a single-molecule and single-chain magnets [9, 10]. Many other potential applications in areas as diverse as catalysis, optics, magnetic resonance imaging (MRI) have been reported [11-13].

Chlorinated derivative of s-1,3,5-triazine called cyanuric chloride ($C_3N_3Cl_3$) and its derivatives are currently intensively studied heterocyclic compounds with interesting biological qualities for pharmaceutical industry, mainly antifungal, antibacterial, antimalaric and antineoplastic [14-16]. By simple substitution of chlorine atoms in cyanuric chloride, using controlled conditions

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