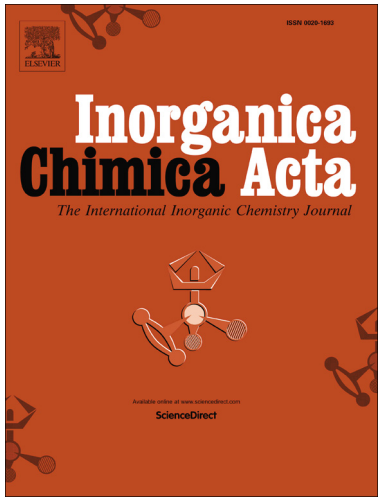

Lanthanide complexes with 3-methoxybenzoic acid and 5,5′-dimethyl-2,2′-bipyridine: crystal structures, luminescence and magnetic property

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Lanthanide complexes with 3-methoxybenzoic acid and 5,5′-dimethyl-2,2′-bipyridine: crystal structures, luminescence and magnetic property

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Abstract

Five dinuclear trivalent lanthanide complexes, $[Ln(3\text{-}MOBA)_3(5,5'\text{-}DM\text{-}2,2'\text{-}bipy)]_2$ (Ln=Er(1), Ho(2), Eu(3), Pr(4), Nd(5); 3-MOBA = 3-methoxybenzoate; 5,5′-DM-2,2′-bipy = 5,5′-dimethyl-2,2′-bipyridine) have been successfully synthesized via conventional solution method at room temperature and structurally characterized by single crystal and powder X-ray diffraction. The molecular structures of complexes **1-5** are very novel-innovative. Complexes **1** and **2** were isomorphic, and the complex **1** was obtained with the coordination number of eight to form a distorted square-antiprism coordination geometry, while complexes **3-5** were nine-coordinated with a distorted monocapped square antiprismatic coordination geometry, but they can be all assembled into the same 1D, 2D supramolecular structure, which has rarely been reported previously. Over the temperature range of 300-1200 K, the thermal decomposition mechanism of complexes **1-5** were discussed by the technology of TG/DSC-FTIR. The luminescence spectra of complex **3** displayed the characteristic emission of Eu^{3+} ion ($^5D_0 \rightarrow {}^7F_{0\text{-}4}$), and it´s CIE coordinate was also calculated as (0.647, 0.341). In addition, the luminescence lifetime and intrinsic luminescence quantum yield were

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