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Supramolecular coordination polymers of La(III), Ce(III), Sm(III), Gd(III) and Eu(III) decorated with rigid 5-hydroxy-1,3-benzenedicarboxylate and flexible hexane-1,6-dicarboxylate linkers: Syntheses, structures, DFT study, luminescence and magnetic properties

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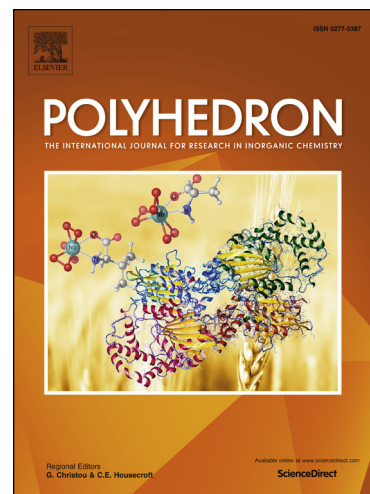
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**Supramolecular coordination polymers of La(III), Ce(III), Sm(III), Gd(III) and Eu(III) decorated with rigid 5-hydroxy-1,3-benzenedicarboxylate and flexible hexane-1,6-dicarboxylate linkers: Syntheses, structures, DFT study, luminescence and magnetic properties**

Mukaddus Kariem,<sup>a</sup> Mohd Yawer,<sup>a</sup> Manesh Kumar,<sup>a</sup> Haq Nawaz Sheikh,<sup>a\*</sup> Puneet Sood,<sup>b</sup> Antonio Frontera,<sup>c</sup> and Joaquín Ortega-Castro<sup>c</sup>

<sup>a</sup> *Department of Chemistry, University of Jammu, Baba Sahib Ambedkar Road, Jammu 180006, India*

<sup>b</sup> *Advanced Materials Research Center, Block-A2 Building, Kamand Campus, Indian Institute of Technology, Mandi, Himachal Pradesh-175005, India*

<sup>c</sup> *Department of Chemistry, Universitat de les Illes Balears, 07122 Palma (Balears), Spain*

**Abstract:**

Five new coordination polymers (CPs) with the formula  $[Ln(hip)(adip)_{0.5}(H_2O)_2]_n \cdot nH_2O$  [ $Ln = La$  (**1**),  $Ce$  (**2**),  $Sm$  (**3**) and  $Gd$  (**4**) and  $[Ln_2(hip)_2(adip)(H_2O)_4]_n \cdot 2nH_2O$  [ $Ln = Eu$  (**5**)] were synthesized by self-assembly of lanthanide salts with rigid [5-hydroxyisophthalic acid ( $H_2hip$ )] and flexible [adipic acid ( $H_2adip$ )] linkers under solvothermal condition. The CPs **1-4** crystallizes in monoclinic  $C_{2/c}$  space group, whereas CP **5** has triclinic  $P-1$  space groups respectively. The CPs **1-4** exhibit 1D linear ladder shaped extension with the linkage of lanthanide carboxylate chains having the backbone of  $H_2hip$  and  $H_2adip$  ligands, whereas CP **5** shows linear orthogonally twisted ladder shaped chains. The 1D linear ladder chains are grafted into three dimensional (3D)

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