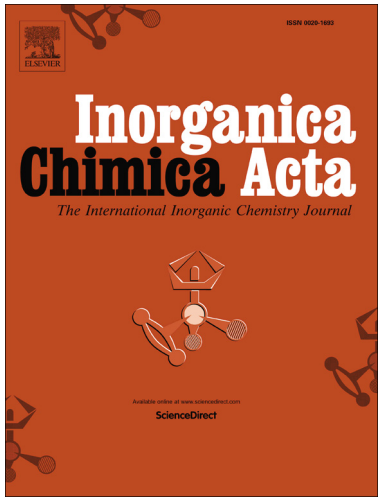


Research paper

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# Sensitization of $Ho^{III}$ and $Sm^{III}$ luminescence by efficient energy transfer from antenna ligands: Magnetic, Visible and NIR Photoluminescence Properties of $Gd^{III}$, $Ho^{III}$ and $Sm^{III}$ Coordination Polymers

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**Abstract**

Hydrothermal reactions of lanthanide metal salts with 2-sulfoterephthalate (2-stp) and 4,4′-bipyridine (4,4'-bipy) led to three coordination polymers, {[Ln(2-stp)(4,4'-bipy)($H_2O$)].($H_2O$)}, [Ln = Gd (**1**), Ho (**2**) and Sm (**3**)]. Their structures have been established by X-ray single crystal diffraction. Complexes **1–3** are isostructural with 2D framework in which all $Ln^{III}$ atoms are nine-coordinated. All these 2D layers are further interlinked via hydrogen bonds resulting in 3D architecture. The solid-state photoluminescence measurements display the characteristic luminescence of Ho (**2**) and Sm (**3**), which is due to efficient energy transfer from the ligands to the central $Ln^{III}$ ions via an "antenna effect". Variable-temperature magnetic susceptibility and isothermal magnetization as function of external magnetic field for **1–3** is studied which reveal mainly the presence of antiferromagnetic interactions and the thermal depopulation of Stark sublevels together with crystal field affects.

Keywords: Lanthanide complex; Hydrothermal Synthesis; X-ray structure; Photoluminescence; Magnetic properties

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