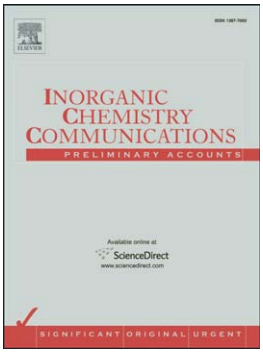

Two novel europium coordination polymers based on fluorine substituted and similar carboxylate ligands: Syntheses, structures and luminescence

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Two novel europium coordination polymers based on fluorine substituted and similar carboxylate ligands: syntheses, structures and luminescence

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ABSTRACT

Two isostructural 3D europium metal–organic frameworks incorporating similar Eu-fluorine substituted carboxylate tectonics, $\{[Eu_4(Mimda)_4\ (Tfpa)_2\cdot 4H_2O]\}_n$ (**1**) and $\{[Eu_4(Pimda)_4\ (Tfpa)_2\cdot 4H_2O]\}_n$ (**2**) (Mimda= 2-methyl-1H- imidazole - 4, 5–dicarboxy acid, while Pimda = 2-propyl-1H- imidazole - 4, 5–dicarboxy acid and Tfpa = (3,4,5,6-tetrafluoro-1,2 phthalate acid) have been synthesized under the hydrothermal conditions. They have been systematically characterized by elemental analyses, IR spectra and PXRD patterns. Single crystal X-ray diffraction analysis reveals that each polymer possesses infinite rod-shaped chain consist of dinuclear Eu-carboxylate building units, which are further pillared by imidazole -dicarboxylate ligands to give rise to 3D open non-interpenetrated frameworks, featuring a (6, 4)-connected pseudo-primitive cubic (pcu) topology. Both two polymers exhibit efficiently sensitized red luminescence due to an energy transfer from substituted dicarboxylate ligand to Eu(III) ions in solid state. It also demonstrates tunable or switchable fluorescence signals in response to the different solvents. Moreover, the luminescent intensity of **1** is increased linearly with the increasing concentration of Pb^{2+} cation in N, N- dimethyl formamide (DMF) suspension, while shows declining trend with Cd2+ cation being introduced.

Keywords: Europium coordination polymer; fluorine substituted carboxylic acid; pollutant cations detecting; thermogravimetry analysis

In recent years, the lanthanide metal organic frameworks (Ln-MOFs), as a unique and emerging class of highly tunable porous materials have attracted wide interest due to their unprecedented tenability

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