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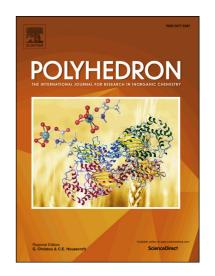
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ACCEPTED MANUSCRIPT

A series of rhombus-shaped Ln_4 clusters: syntheses, structures, luminescence properties and the SMM behavior of the Dy_4 analogue

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Abstract

tetranuclear Α series of lanthanide(III) clusters, namely, $[Ln_4(\mu_3-OH)_2L_6(acac)_4]\cdot xCH_3CN$ (Ln(III) = Tb(1), Dy(2) and Ho(3), HL = 5-(4-o-hydroxybenzylidene)-8-hydroxylquinoline; acac = acetylacetone), have been synthesized and completely characterized. The X-ray structural analysis exhibit that clusters 1-3 contain one Ln₄ center with rhombus-shaped arrangement, and each Ln(III) ion of them is located in a distorted square-antiprismatic coordination sphere. Magnetic measurements indicated that single molecule magnets behaviors were observed in 2, with energy barrier ($\Delta E/k_{\rm B}$) of 55.17 K and $\tau_0 = 8.19 \times 10^{-7}$ s. Additionally, luminescence properties study reveal that 1 and 2 display the characteristic Tb^{III} and Dy^{III} luminescence at room temperature.

Keywords: tetranuclear lanthanide(III) clusters; structures; magnetic properties; luminescence properties; single molecule magnets behaviors

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