



A ferromagnetically coupled, bell-shaped $[\text{Ni}_4\text{Gd}_5]$ cage.

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Streszczenie

Reaction between $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$, 2-hydroxy-4-methyl-6-phenyl-pyridine-3-amidoxime (H_2L), benzoic acid, and $\text{M}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$ ($\text{M} = \text{Gd}, \text{Y}$) in MeCN under basic conditions yields the complexes $[\text{Ni}^{\text{II}}_4\text{Gd}^{\text{III}}_5(\text{PhCOO})_{10}(\text{HL})_4(\text{HL}_{\text{zw}})_4(\text{OH})_2(\text{NO}_3)_2]\text{Cl} \cdot 13.6\text{MeCN} \cdot \text{H}_2\text{O}$ (**1**·13.6MeCN·H₂O) and $[\text{Ni}^{\text{II}}_4\text{Y}^{\text{III}}_5(\text{PhCOO})_{10}(\text{HL})_4(\text{HL}_{\text{zw}})_4(\text{OH})_2(\text{NO}_3)_{1.5}(\text{H}_2\text{O})_{0.5}]\text{Cl}(\text{NO}_3) \cdot 3\text{H}_2\text{O}$ (**2**·3H₂O). Both clusters display similar structures, consisting of a bell-shaped $\{\text{Ni}^{\text{II}}_4\text{M}^{\text{III}}_5\}$ unit, in which a linear “zigzag” $\{\text{Ni}_4\}$ subunit bisects the central $\{\text{M}^{\text{III}}_5\}$ “ring”. Direct (dc) and alternating current (ac) magnetic susceptibility measurements carried out in the 2–300 K temperature range for complexes **1** and **2** revealed ferromagnetic intermolecular interactions, while heat-capacity measurements for the Gd analogue suggest that complex **1** lowers its temperature from $T = 9.6$ K down to 2.3 K by adiabatically demagnetizing from $B_i = 7$ T to $B_f = 0$.

Adres publiczny

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<https://www.acs.org/content/acs/en.html>