SUPPORTING INFORMATION

A New Family of Nonanuclear Lanthanide Clusters Displaying Magnetic and Optical Properties

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Unit Cell Parameters for Complexes 2 and 3

Complex $[Gd_9(OH)_{10}(hmp)_8(NO_3)_8(DMF)_8]\cdot(OH)\cdot x(solvents)$ (**2**·x(solvents))

Tetragonal space group *P*4/*n*

a = b = 19.114(2), c = 16.374(3), V = 5982 $Å^3$

Complex $[Eu_9(OH)_{10}(hmp)_8(NO_3)_8(DMF)_8]\cdot(OH)\cdot x(solvents)$ (**3**·x(solvents))

Tetragonal space group *P*4/*n*

a = b = 19.124(3), c = 16.417(3), V = 6004 $Å^3$

Microanalytical Data for Vacuum-dried Complexes 1-3

Complex $[Dy_9(OH)_{10}(hmp)_8(NO_3)_8(DMF)_8]\cdot(OH)\cdot 1.6H_2O\cdot 0.6CH_2Cl_2$ (**1**$\cdot 1.6H_2O\cdot 0.6CH_2Cl_2$)

Analyzed as solvent-free **1**:

Anal. Calcd (Found) for $C_{72}H_{115}Dy_9N_{24}O_{51}$: C, 24.05 (24.08); H, 3.22 (3.12); N, 9.35 (9.29).

Complex $[Gd_9(OH)_{10}(hmp)_8(NO_3)_8(DMF)_8]\cdot(OH)\cdot$x(solvents) (**2**$\cdot$x(solvents))

Analyzed as solvent-free **2**:

Anal. Calcd (Found) for $C_{72}H_{115}Gd_9N_{24}O_{51}$: C, 24.37 (24.79); H, 3.27 (3.24); N, 9.47 (9.61).

Complex $[Eu_9(OH)_{10}(hmp)_8(NO_3)_8(DMF)_8]\cdot(OH)\cdot$x(solvents) (**3**$\cdot$x(solvents))

Analyzed as solvent-free **3**:

Anal. Calcd (Found) for $C_{72}H_{115}Eu_9N_{24}O_{51}$: C, 24.71 (24.87); H, 3.31 (3.23); N, 9.60 (9.69).

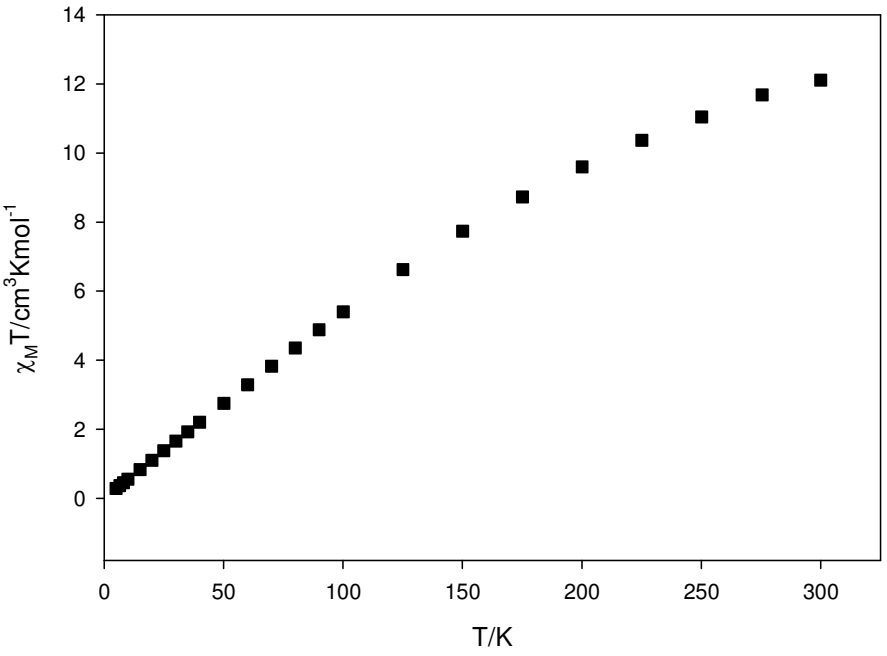

Figure S1. $\chi_M T$ vs T plot for complex **3** in a 0.1 T field.

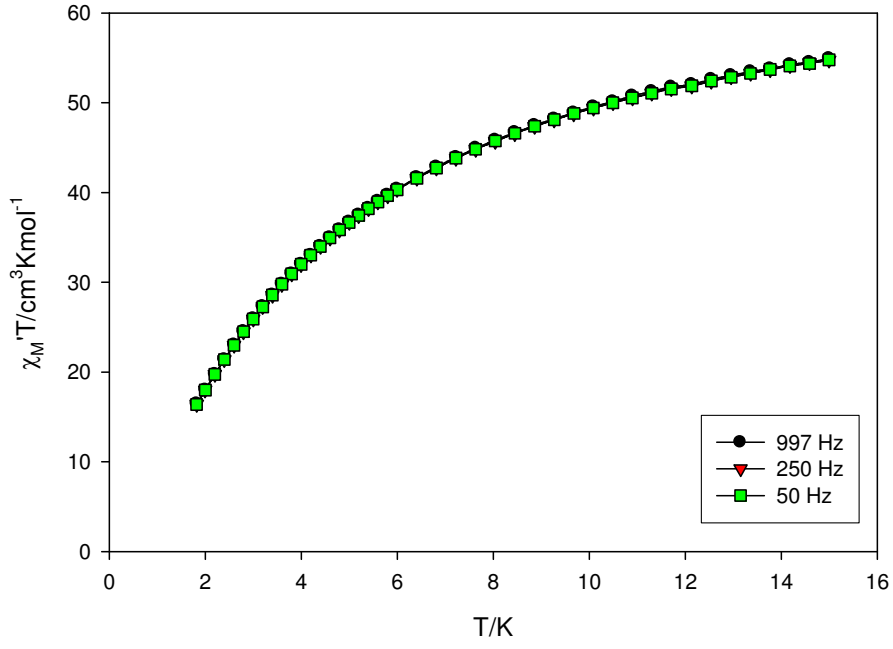

Figure S2. Plot of the in-phase ac susceptibility (χ_M' as $\chi_M'T$) of **2** in a 3.5 G field oscillating at the indicated frequencies.

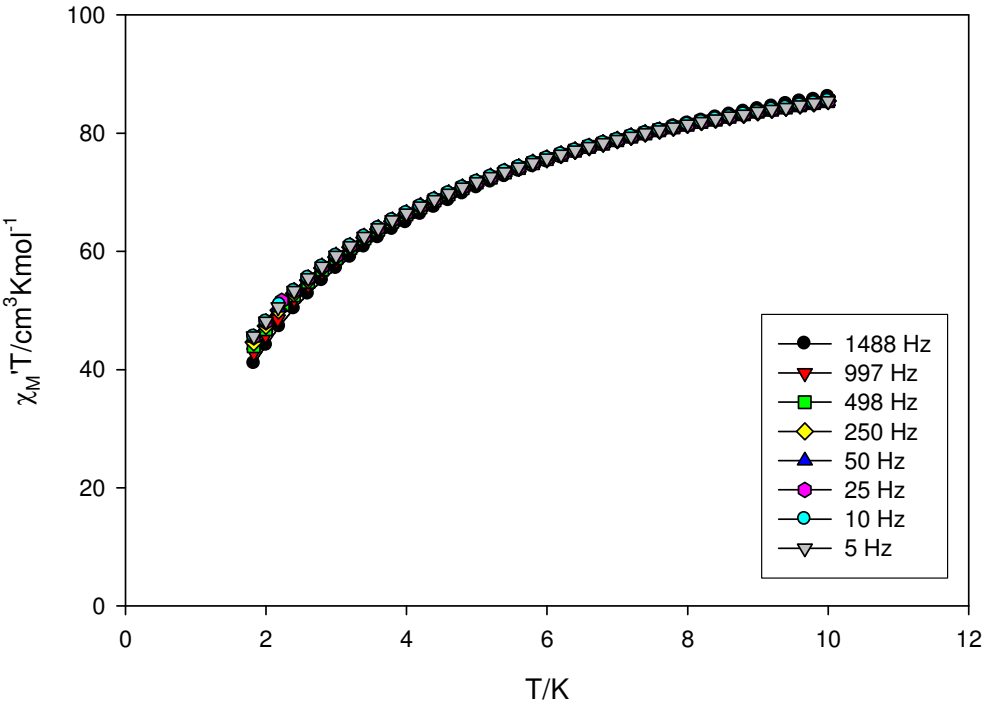

Figure S3. Plot of the in-phase ac susceptibility signals (χ_M' as $\chi_M'T$) of **1** in a 3.5 G field oscillating at the indicated frequencies.