Electronic Supplementary Material (ESI) for Dalton Transactions.
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Electronic Supplementary Material (ESI) for

Structural and magnetic studies of mononuclear lanthanide complexes derived from N-rich chiral Schiff bases.

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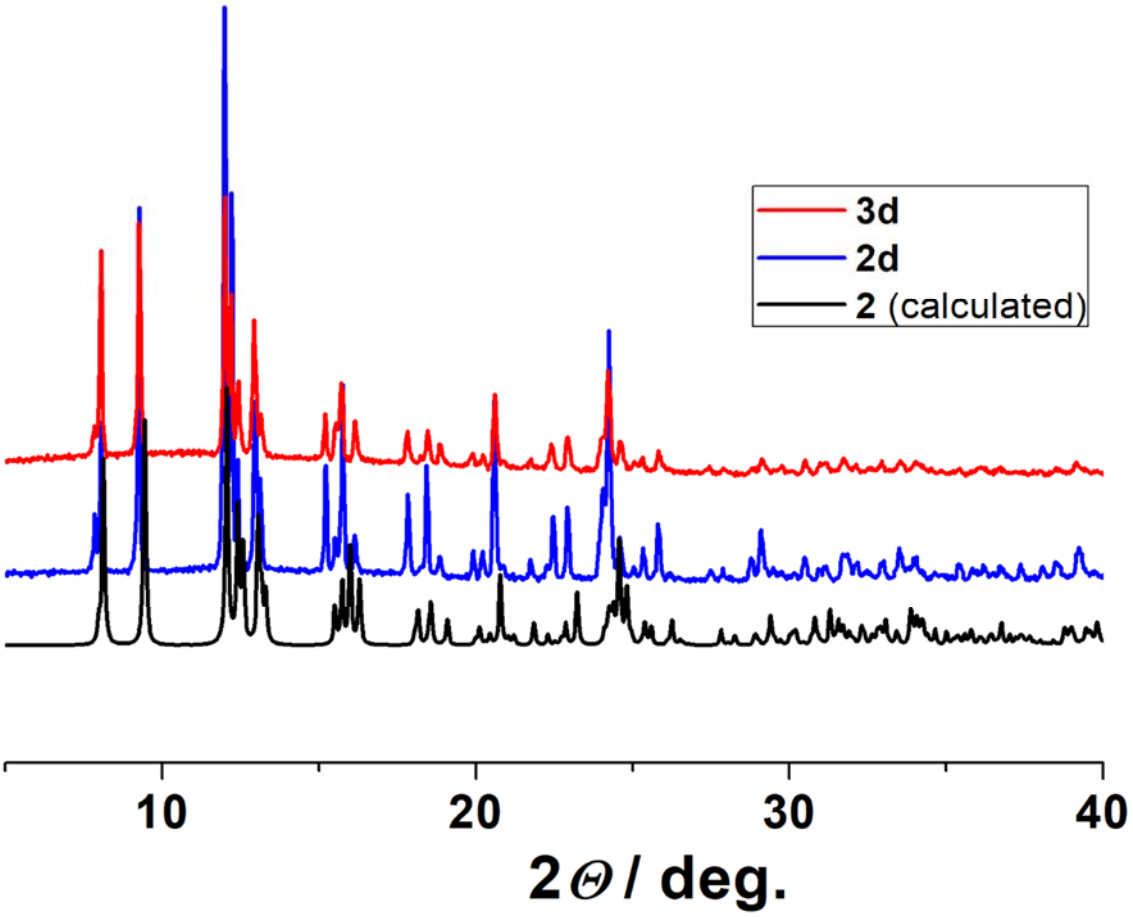

Fig. *S*1. Powder X-Ray spectra for the diluted complexes **2d** and **3d**. In black is represented the simulated powder spectra from the single crystal structure of the complex **2**.

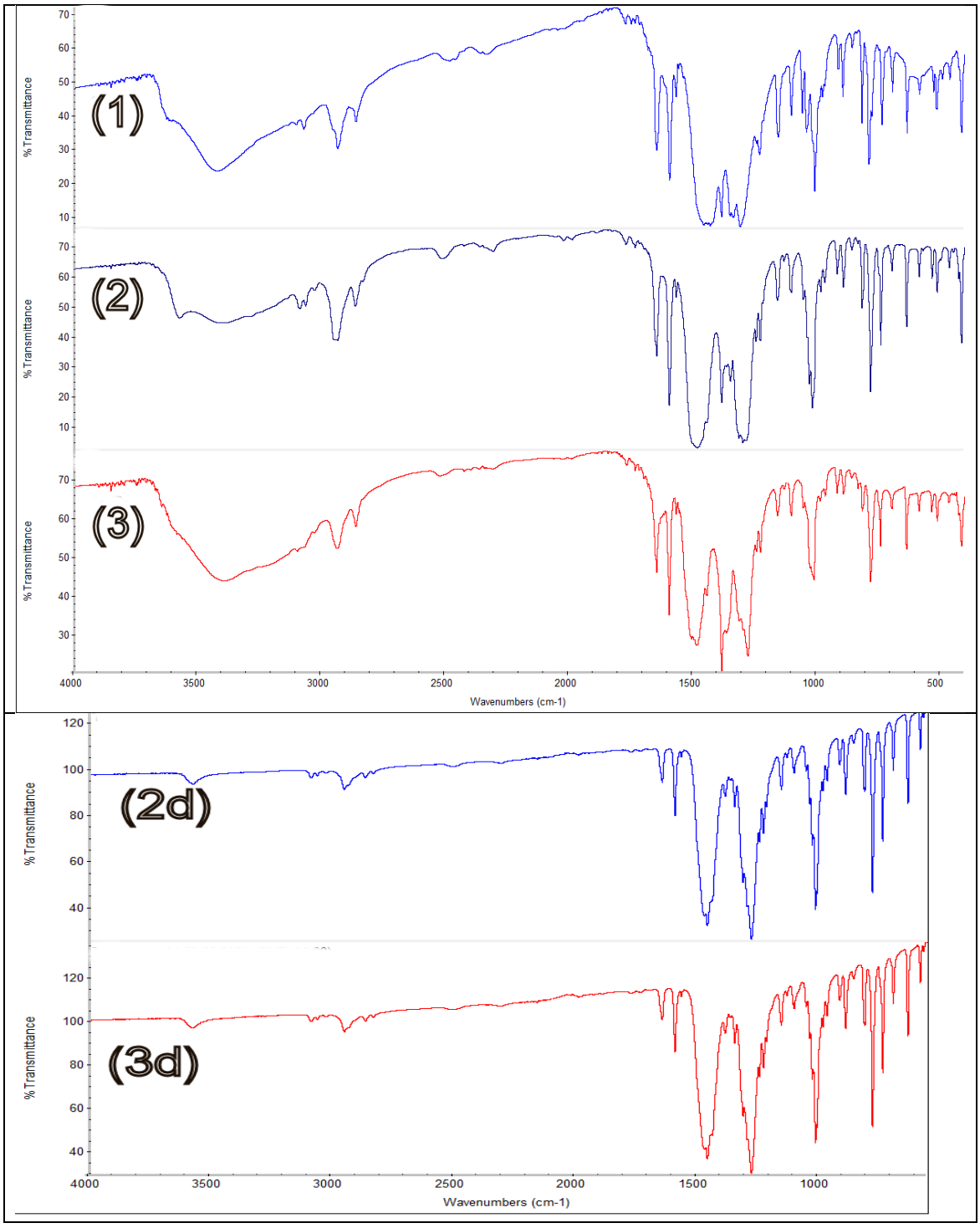

Fig. *S*2. IR spectra for complexes $[Ce(L)(NO_3)_3(MeOH)]$ (**1**), $[Gd(L)(NO_3)_3]$ (**2**) and $[Dy(L)(NO_3)_3]$ (**3**) the diluted **2d** and **3d**.

Table S1. CShM values for the undecacoordinated environment of complex **1** and the decacoordinated complex **2**. The relatively high distortion with the ideal polyhedra are due to the low bite of the nitrato and *cis* N-donors of the Schiff base.

11-vertex Polyhedra	Ce^{III} (**1**)	**10-vertex Polyhedra**	Gd^{III} (**2**)
Capped pentagonal prism (C5v)	5.64	Bicapped cube (D4h)	9.77
Capped pentagonal antiprism (C5v)	5.99	Bicapped square antiprism (D4d)	4.67
Augmented sphenocorona (cs)	7.73	Metabidiminished icosahedron (C2v)	7.08
		Sphenocorona (C2v)	3.05
		Staggered Dodecahedron (D2)	4.66

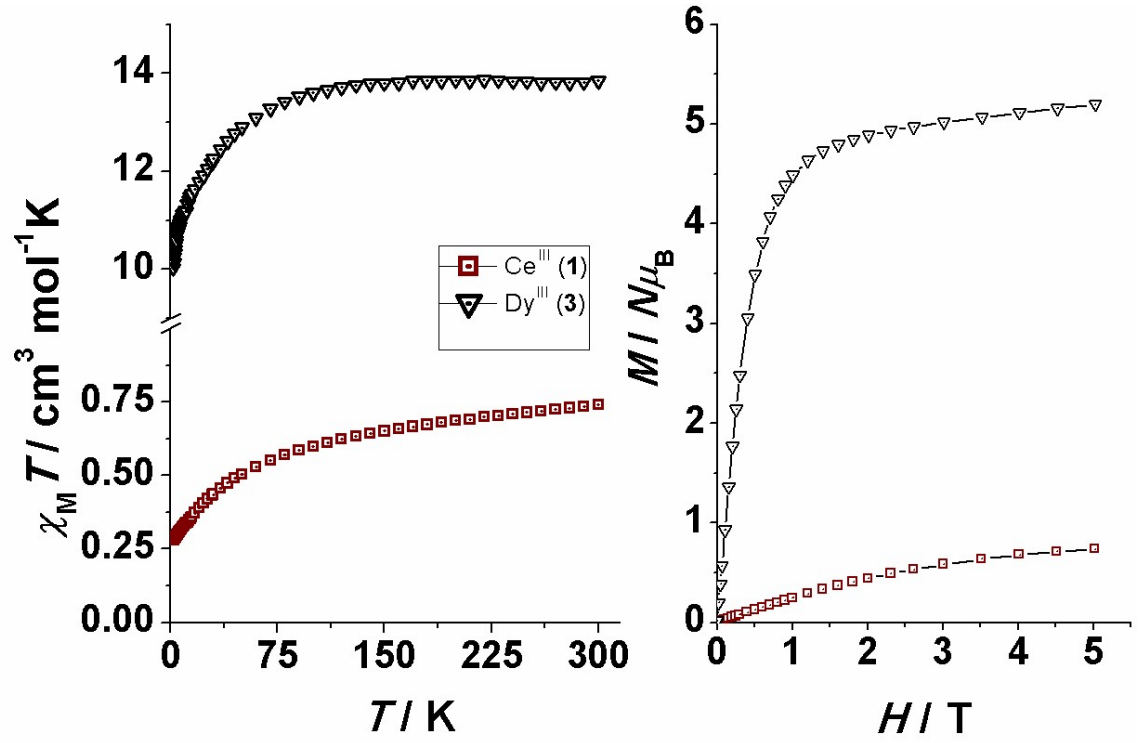

Fig. S3. $\chi_M T$ (left) and magnetization (right) plots for referred complexes. The $\chi_M T$ values at room temperature are very close to the expected values for a lonely isolated lanthanide ions (**expected**/experimental $cm^3 \cdot mol^{-1} \cdot K$): Ce^{III}, ($^2F_{5/2}$, g = 6/7, **0.80**/0.74 $cm^3 \cdot mol^{-1} \cdot K$), Dy^{III} ($^6H_{15/2}$, g = 4/3, **14.2**/13.8 $cm^3 \cdot mol^{-1} \cdot K$).

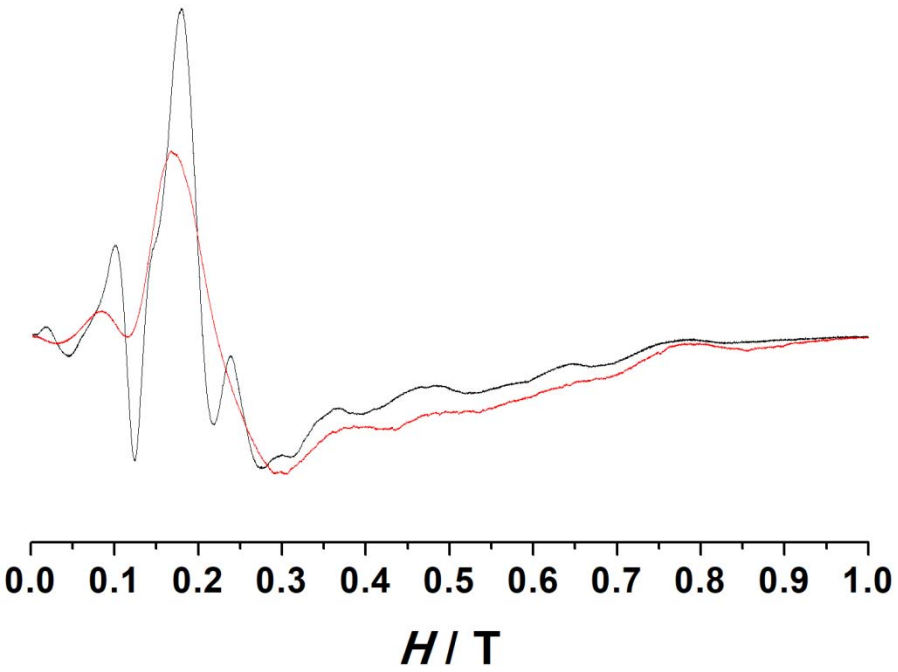

Fig. *S*4. *X*-band EPR spectra for the Gd^{III} compounds **2** (red) and **2d** (black). Reduction of dipolar interactions allows shaper lines for **2d**. The identical spectra confirm the same environment after dilution.

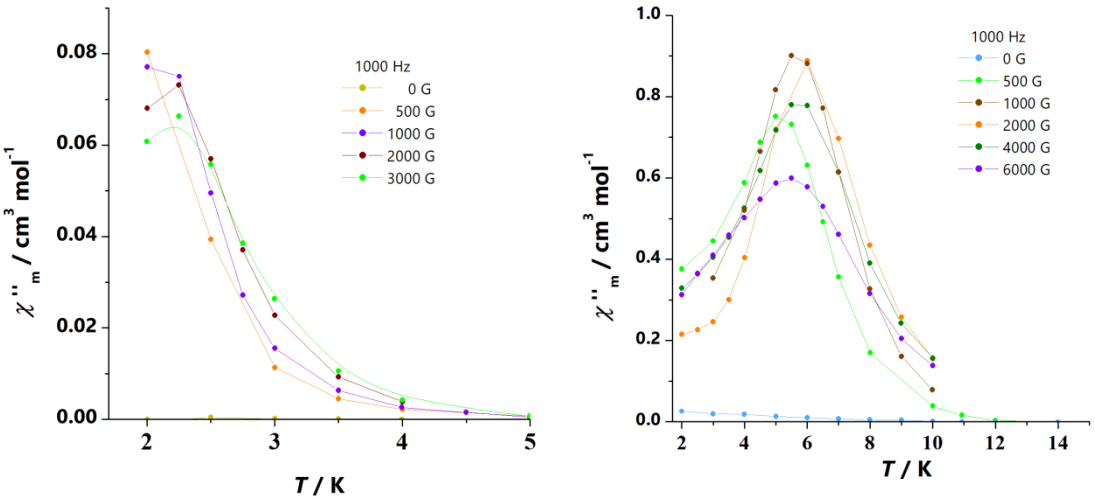

Fig. *S*5. χ_M'' dependence of the transverse field for complex **1** (left) and **3** (right). From this initial dependence the fields to perform the *ac* measurements were 2000 G for **1** and 1000 G for **3**.

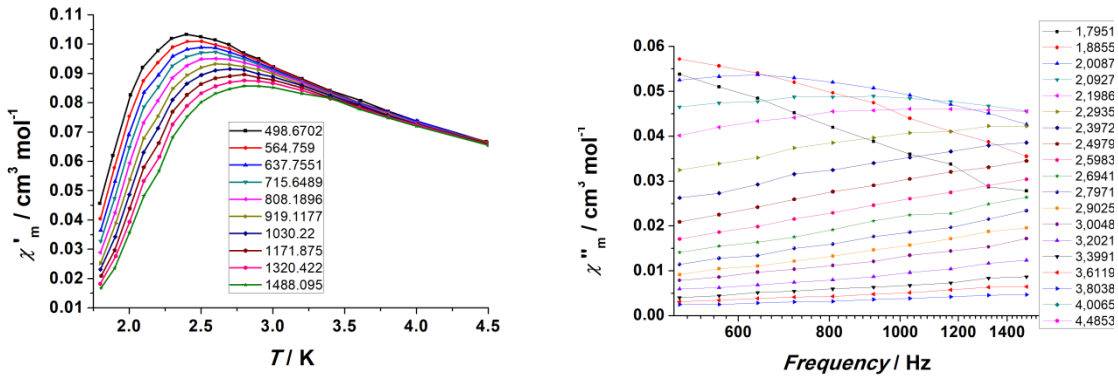

Fig. *S*6. χ'_M vs. *T* (left) and χ''_M *vs*. frequency (right) for complex **1**.

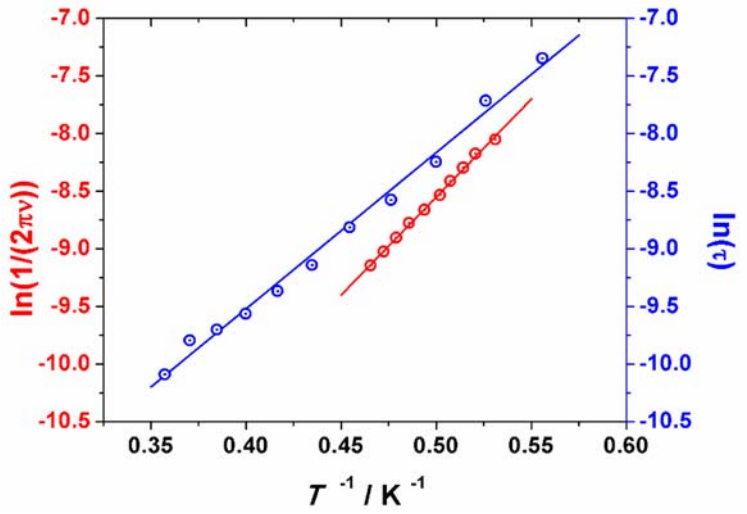

Fig. *S*7. Plot of ln(1/2$\pi\nu$) vs. T^{-1} from the $\chi'_M(T)$ data (red) and ln(τ) vs. T^{-1} from the fit of the Argand plot (blue) for complex **1**.