

Electronic Supplementary Material (ESI) for Dalton Trans.

"Magnetic and optical study in a new family of multidimensional and multiproperty PO-lanthanide(III) derived systems."

**Evangelos Pilichos,^a Annia Tubau,^a Mercè Font-Bardia,^b Saskia Speed,^a Albert Escuer^{a,c}
Arnald Grabulosa^{*a,c} and Júlia Mayans ^{*a,c}**

^a Departament de Química Inorgànica i Orgànica, Secció Inorgànica and Institute of Nanoscience (IN²UB) and Nanotechnology, Universitat de Barcelona, Martí i Franquès 1-11, Barcelona-08028, Spain.

^b Departament de Mineralogia, Cristal·lografia i Dipòsits Minerals, Universitat de Barcelona, Martí Franqués s/n, 08028 Barcelona (Spain) and Unitat de Difracció de R-X. Centre Científic i Tecnològic de la Universitat de Barcelona (CCiTUB), Solé i Sabarís 1-3. 08028 Barcelona.

^c Institute of Nanoscience and Nanotechnology (IN²UB). Universitat de Barcelona, Martí i Franquès 1-11, Barcelona-08028, Spain.

Fig. S1. Powder diffraction spectra

Fig. S2. Infrared spectra for complexes **1** and **3**.

Fig. S3. AC susceptibility measurements for complexes **1** and **5** under different dc applied fields

Fig. S4. Arrhenius-like fit for the high temperature region of complex **6**

Fig. S5. Absorption and emission spectra of the free ligand DppO₂

Fig. S6. Emission color under irradiation of a UV lamp of compounds **4** and **5**.

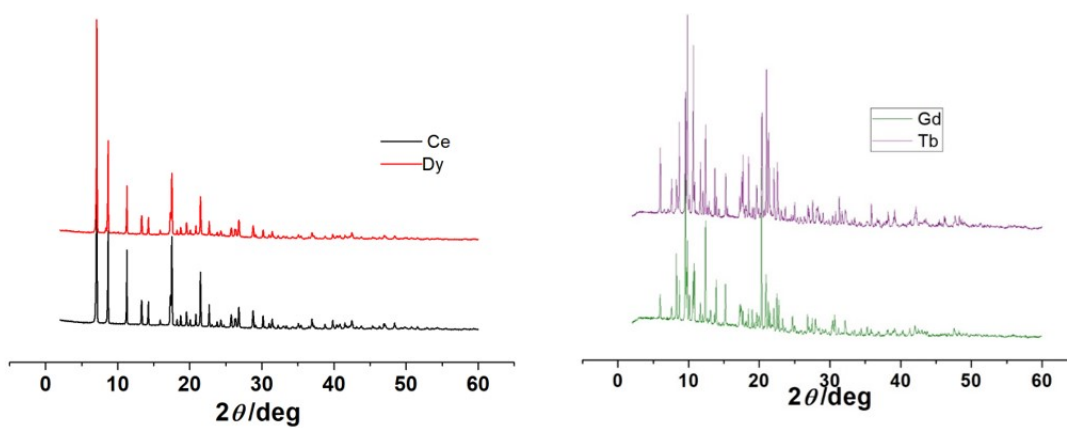


Fig. S1. Left, powder diffraction spectra for compounds **1** and **6**. Right, powder diffraction spectra for compounds **4** and **5**.

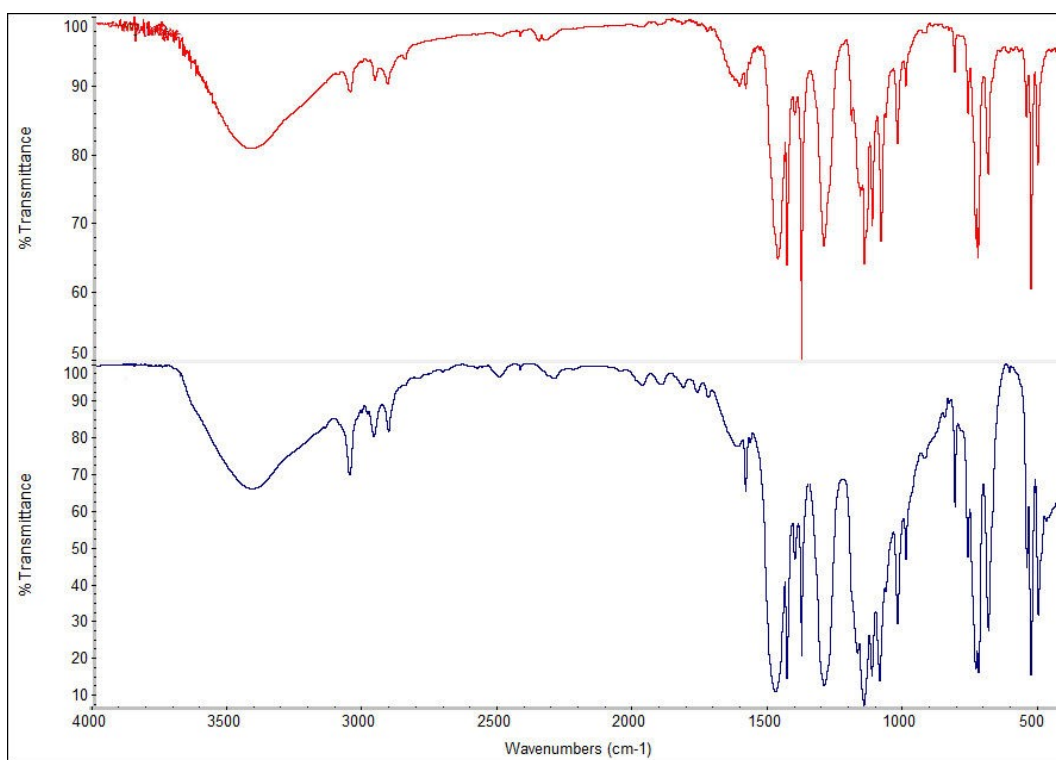


Fig. S2. Infrared spectra for the representative 2D Ce^{III} complex **1** (top) and the Eu^{III} 1D system **3**.

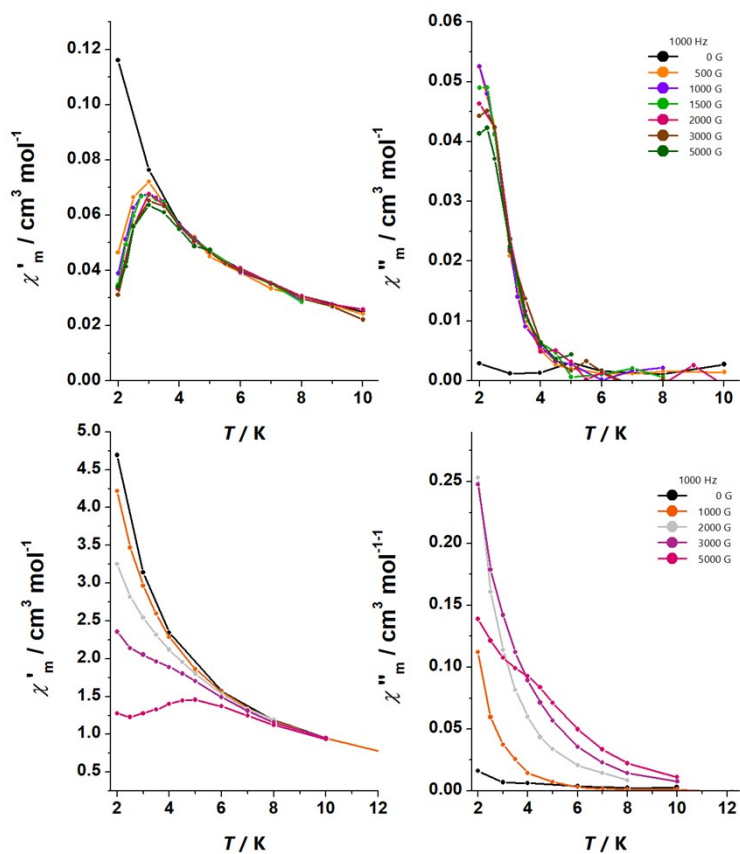


Fig. S3. AC susceptibility measurements for complexes **1** (top) and **5** (bottom) under different dc applied fields, showing the tails of out-of-phase signals at low temperature.

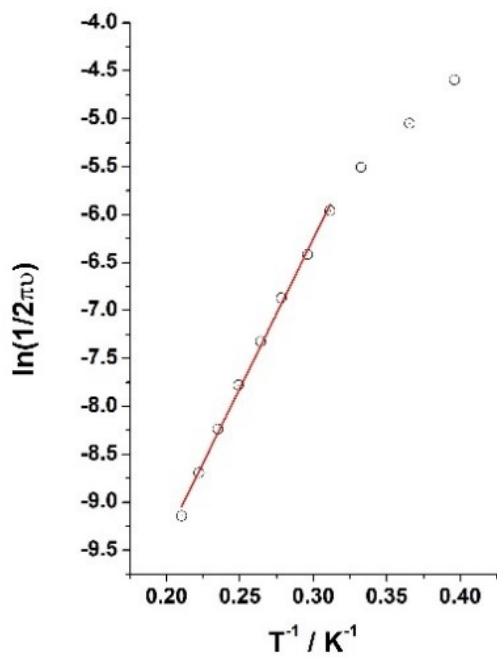


Fig. S4. Arrhenius-like fit for the high temperature region of complex **6**.

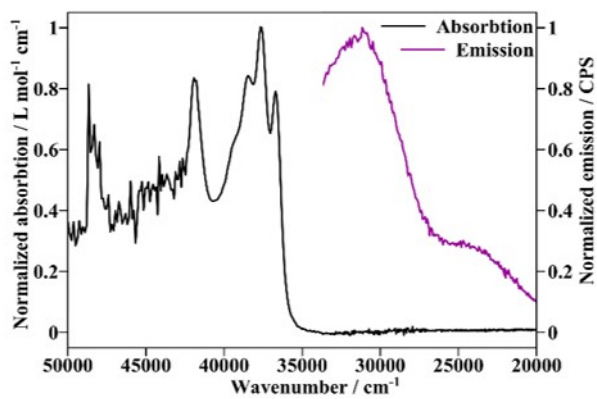


Fig. S5. Absorption and emission spectra of the free ligand DppO₂ measured in a $3.4 \cdot 10^{-6}$ M CHCl₃ solution.

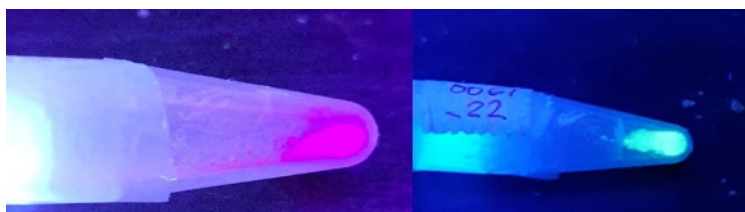


Fig. S6. Emission color under irradiation of a UV lamp of compounds **4** (left) and **5** (right).