**ELECTRONIC SUPPORTING INFORMATION FOR**

# Heterometallic Co-Dy SMMs grafted on iron oxide nanoparticles

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**Fig. S1.** XPS spectra for complex **1**, the iron oxide **NP** and the hybrid system **1-NP**. The asterisk marks a peak due to fluoride contamination.

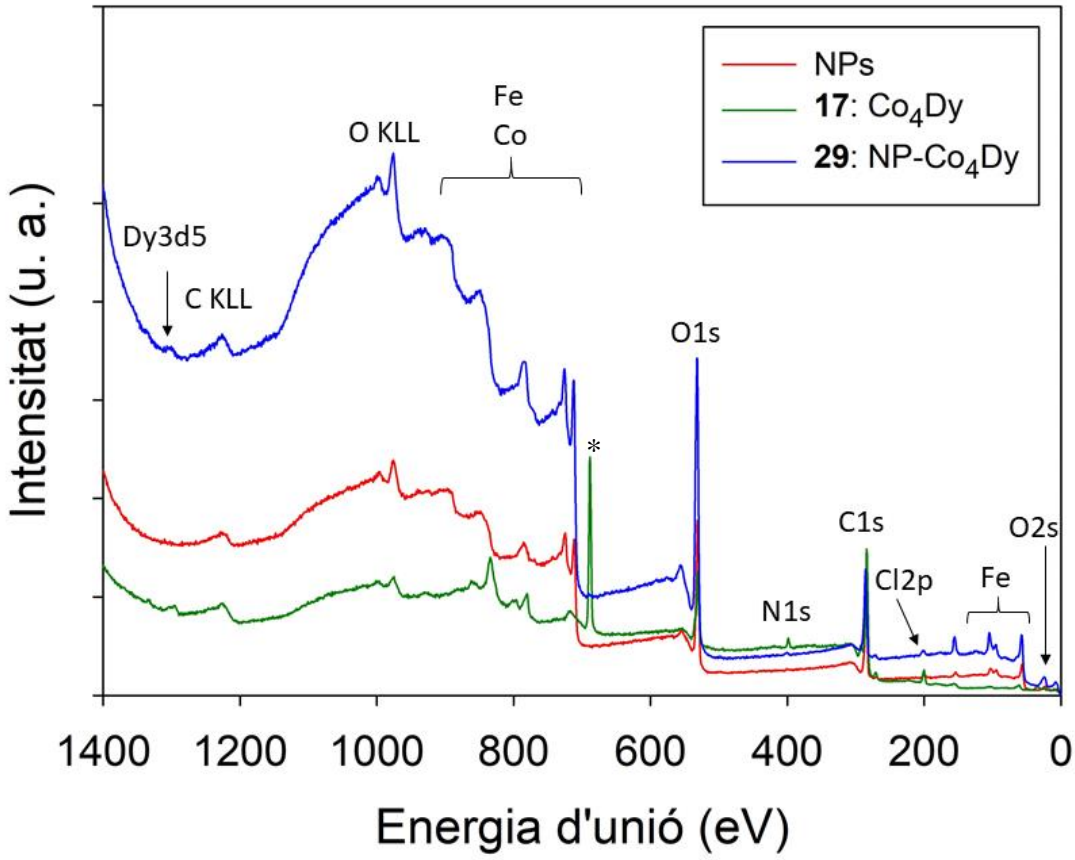
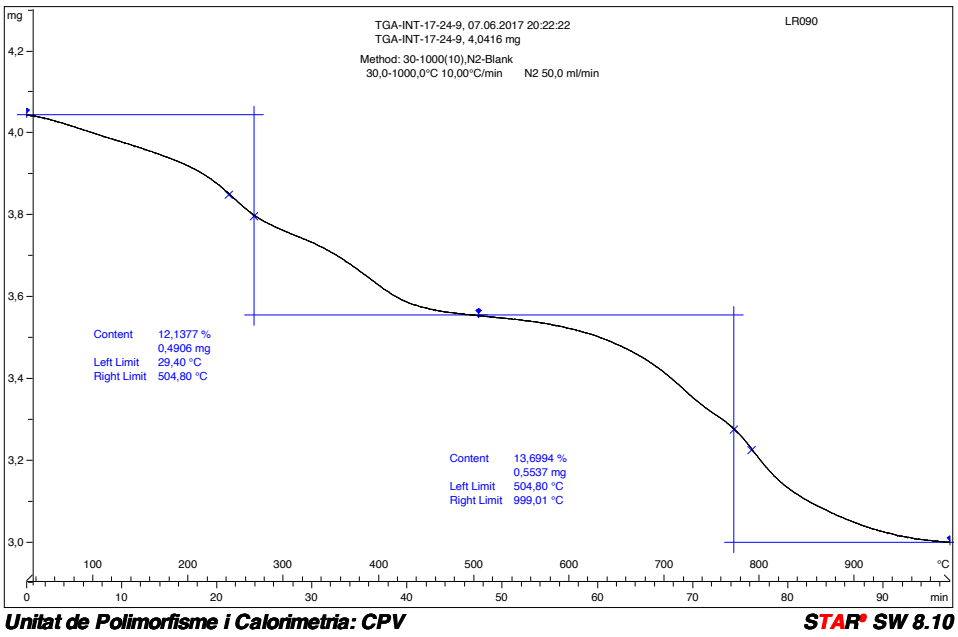


**Fig. S2.** Thermogravimetric analysis of NP (top) and 1-NP (bottom).



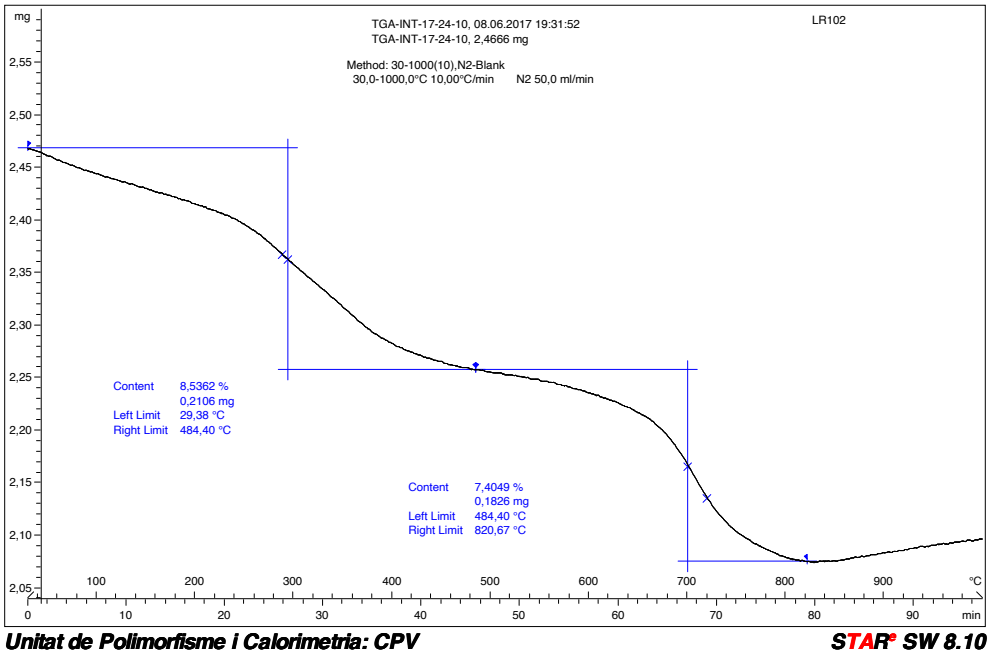



**Table S1.** Expectation values of the Dy spin and orbital angular momentum operators and of the resulting magnetic moments obtained from the sum rule analysis applied to the spectra plotted in Figures 4 and 5. Estimated errors on the last digit are given in parentheses.

| Sample | Field (T) | $\langle S_z \rangle/\hbar$ | $\langle L_z \rangle/\hbar$ | $M_z/\mu_B$ |
|---|---|---|---|---|
| **1-NP** | 6.5 | 0.8(1) | 2.0(2) | 3.5(3) |
| **1** | 6.5 | 0.9(1) | 2.3(2) | 4.0(3) |

**Fig. S3.** (left) Example XAS and XAS integral taken at the Dy $M_{4,5}$ edges on **1** at 2 K and 6.5 T. (right) Corresponding XMCD and XMCD integral. Off-resonant parts of the XAS between the $M_5$ and $M_4$ edges were excluded from the integration.

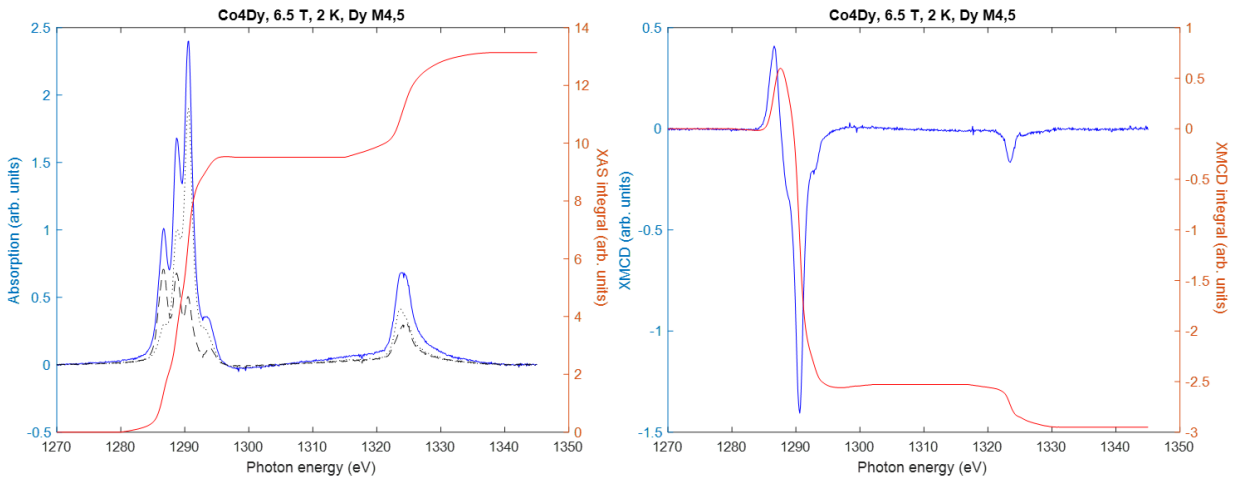
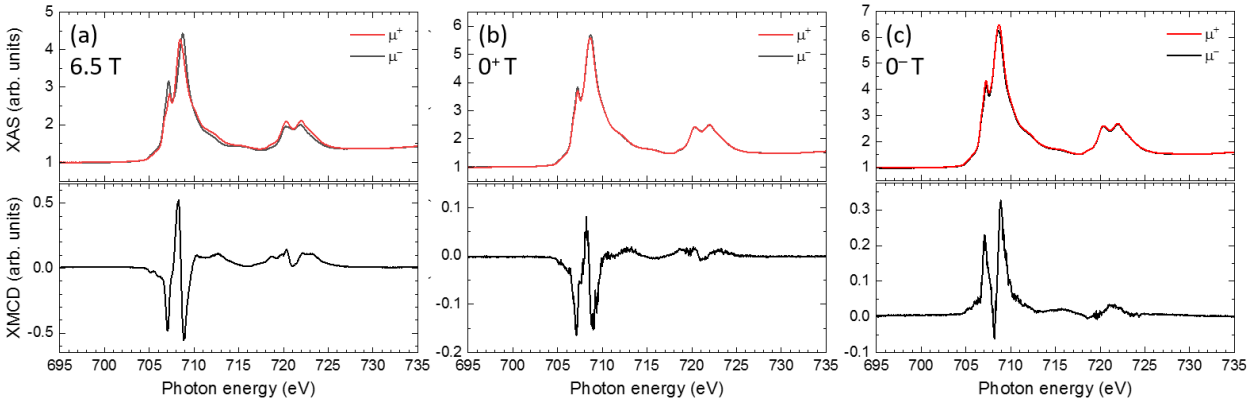



**Fig. S4**. XAS and XMCD spectra at the Fe $L_{2,3}$ edges recorded on the **1-NP** hybrid system at 2 K (a) at 6.5 T, (b,c) at remanence at 0.0 T after application of +6.5 T (b) and -6.5 T (c). The change of sign of the XMCD signal indicates that the remanent magnetization is associated with the Fe magnetic moment as expected for the magnetite NP.


(a)
6.5 T
(b)
0⁺ T
(c)
0⁻ T
μ⁺
μ⁻
XAS (arb. units)
XMCD (arb. units)
Photon energy (eV)