SUPPORTING INFORMATION

Noncovalent Grafting of a Dy_2^{III} Single-Molecule Magnet onto Chemically Modified Multiwall Carbon Nanotubes

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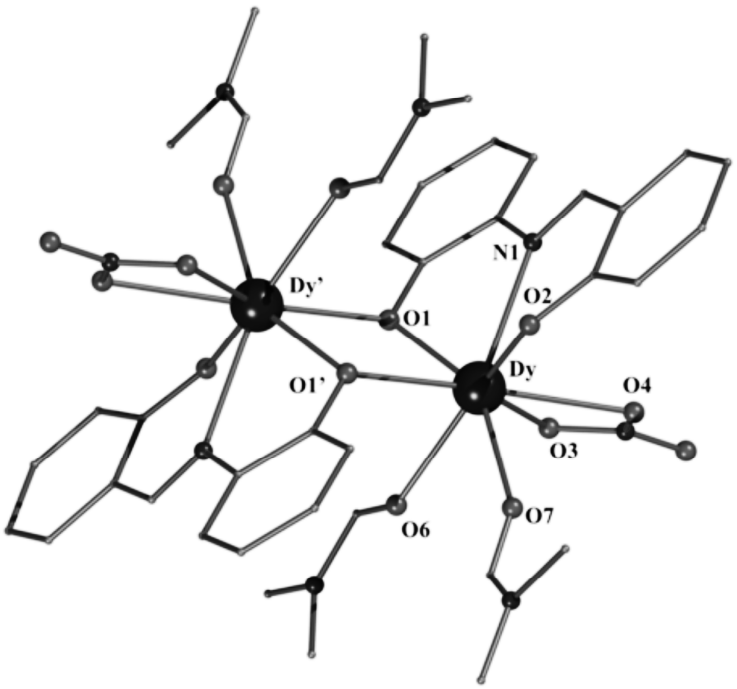

Figure S1. The molecular structure of Dy2 molecule. Unprimed and primed atoms are related by the symmetry operation –x+2, -y, -z. Selected interatomic distances (Å) and angles (^{o}): Dy1...Dy1' 3.738(1) Å, Dy1-O1 2.323(2) Å, Dy1-O1' 2.322(3) Å, Dy1-O2 2.200(3) Å, Dy1-N1 2.525(4) Å, Dy1-O(NO_3^-, DMF) 2.319(3)-2.482(3) Å ; O1-Dy1-O1' 72.8(1), O3-Dy1-O4 51.7(1)^{o},O1'-Dy1-O4 163.3(1)^{o}, O2-Dy1-O6 146.9(1)^{o}, Dy1-O1-Dy1' 107.2(1)^{o}.

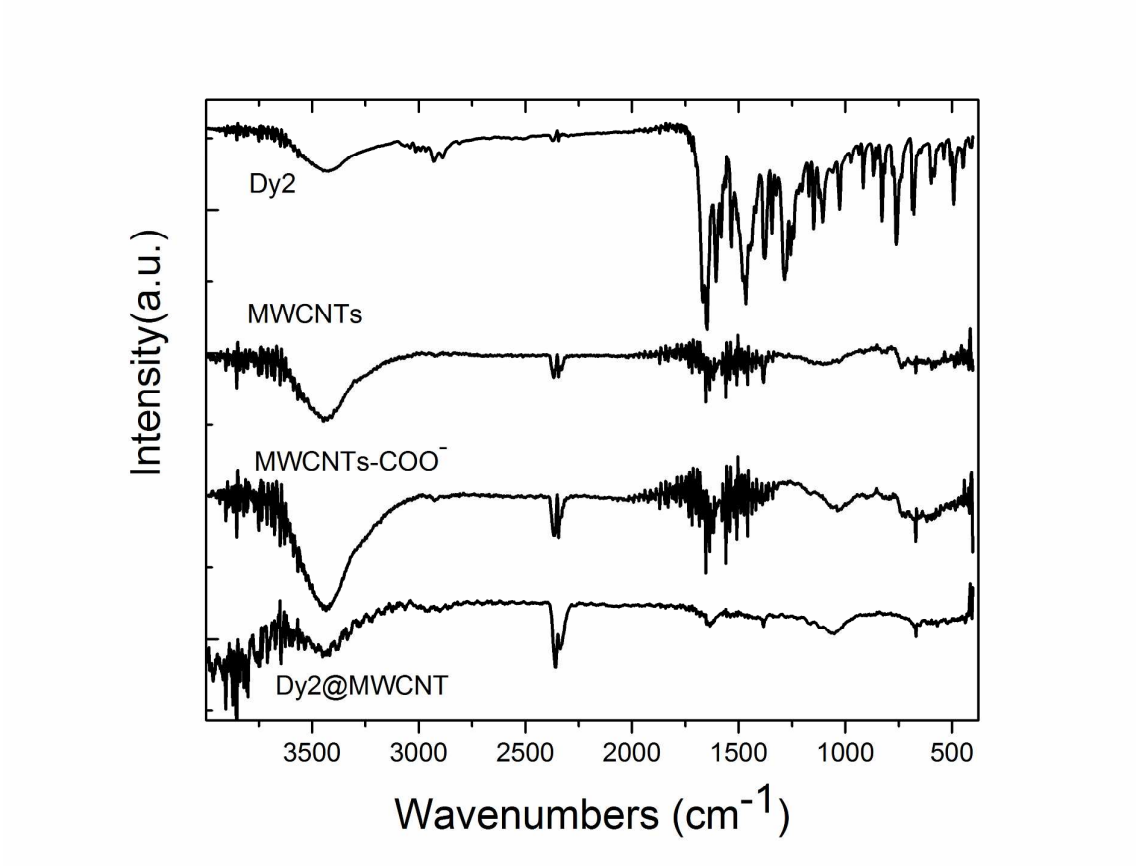

Figure S2. IR spectra of the Dy2 compound; the raw MWCNT material; the carboxylated MWCNT and the the final hybrid material after the washing cycles (from up to down).

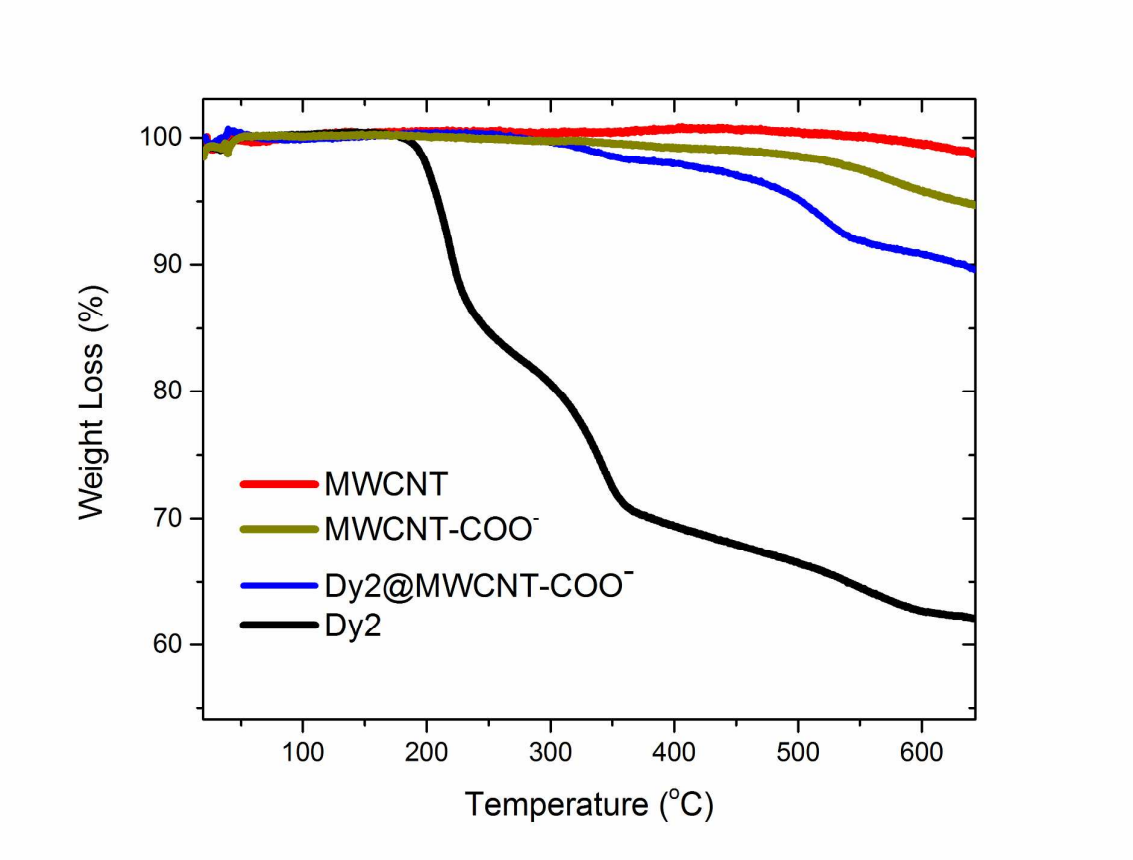

Figure S3. Thermogravimetric measurements of the raw material MWCNT (red line); carboxylated MWCNT (green line); hybrid material Dy2@MWCNT (blue line) and the Dy2 compound (black line)

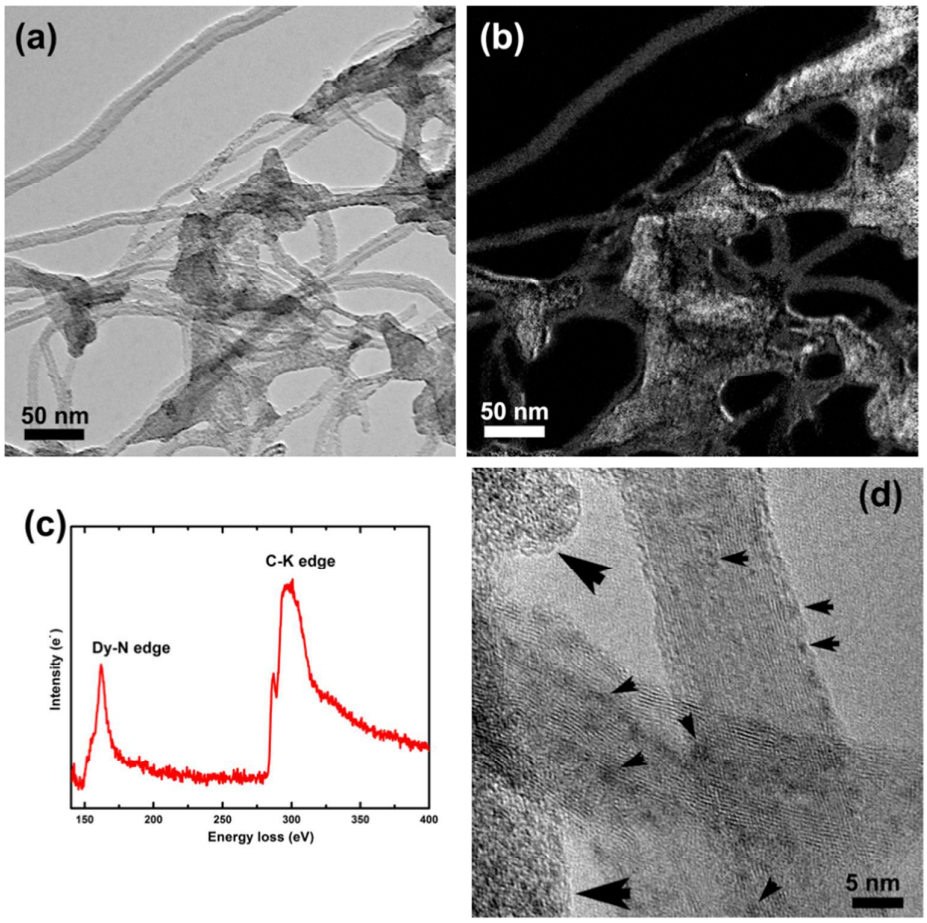

Figure S4. (a) A typical bright field image of the pre-washed hybrid material. MWCNT with a diameter in the range of 5-20nm can be seen, decorated with low contrast small precipitates. Also large areas of low contrast material in-between the nanotubes are observed. (**b)** EFTEM mapping of the distribution of Dy in the area imaged in (a), where regions with bright contrast correspond to high Dy concentration. **(c)** The background subtracted electron energy loss spectrum corresponding to the area imaged in (a). The Dy N-edge at 154 eV, in addition to the C K-edge at 280 eV originating from the carbon nanotubes, proves the existence of dysprosium in the composite material. **(d)** High Resolution TEM (HRTEM) image of a nanotube At the left part of the HRTEM image the edges of a large Dy2 agglomerate is shown by big arrows. On the surface and the interior of the nanotube low contrast objects indicated by small arrows are observed.

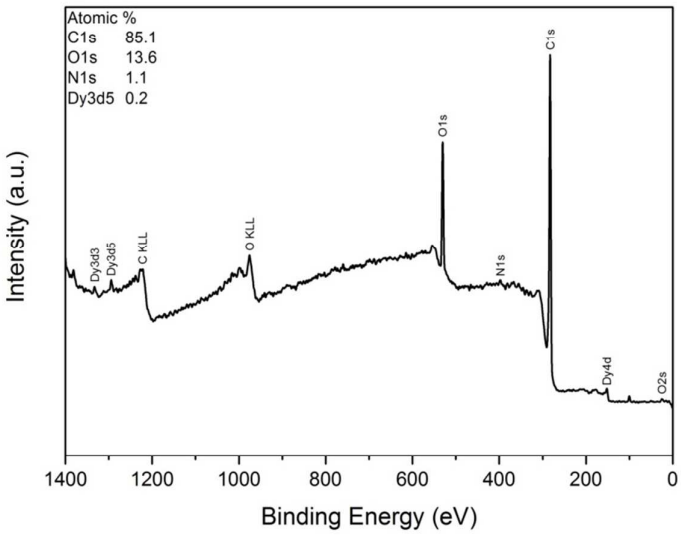

Figure S5. Survey XPS pattern of the Dy2 powder reference with the peaks belonging to C, N, O and Dy indicated

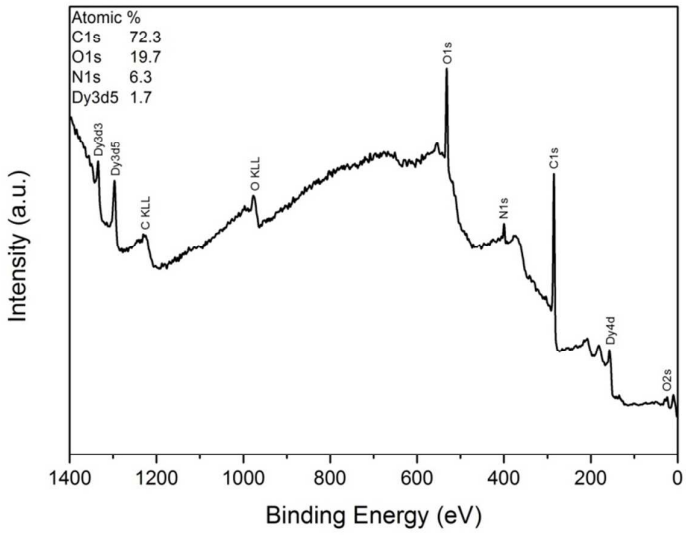

Figure S6. Survey XPS pattern of the hybrid material Dy2@MWCNT with the peaks belonging to C, N, O and Dy indicated.

Table S1. The profile characteristics of D, G, D' Raman bands

	D /cm^{-1} (Pos, FWHM, A)*	G /cm^{-1} (Pos, FWHM, A)	D' /cm^{-1} (Pos, FWHM, A)	I_D/I_G
MWCNT	(1316.5, 53.5, 73.2)	(1589.4, 51.7, 28.6)	(1617.0, 21.0, 7.5)	2.6
MWCNT-COO	(1317.1, 56.7, 74.5)	(1587.1, 52.1, 27.7)	(1616.0, 23.2, 7.1)	2.7
Dy2@MWCNT	(1317.6, 57.6, 67.4)	(1588.5, 63.0, 32.2)	(1615.2, 17.7, 5.0)	2.1

*Pos = position, A = area. All values based on averaged results from spectra of 6 analogous samples.

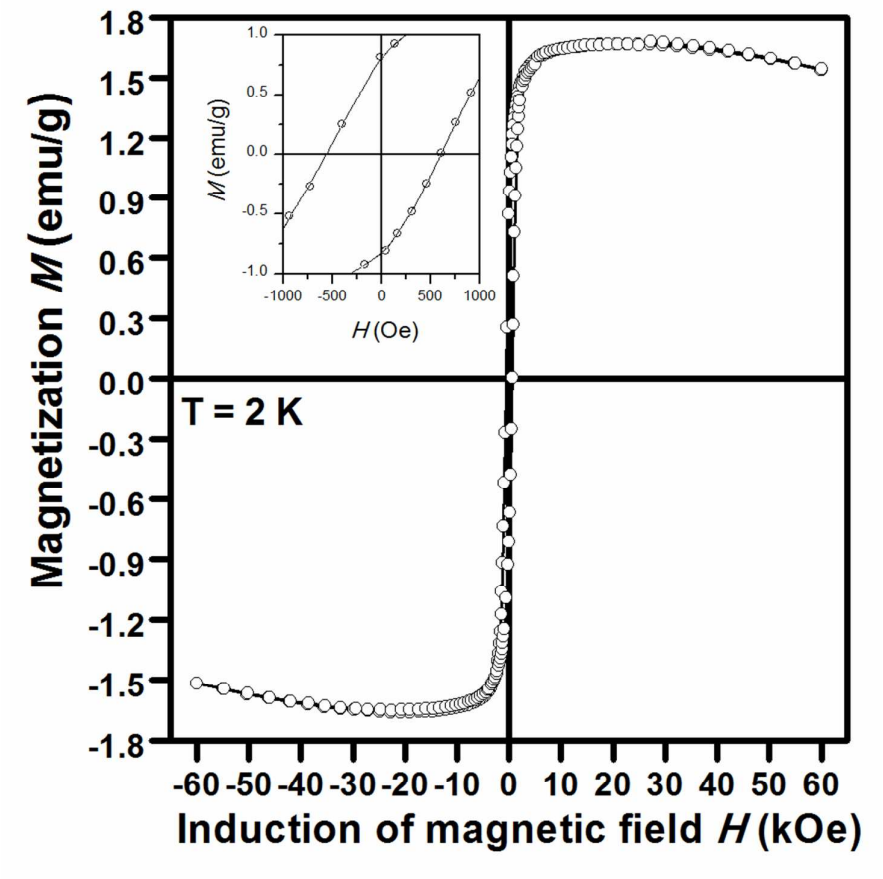

FIGURE S7. Magnetization measurements of the functionalized MWCNT-COOH at 2 K. In the inset is shown an enlargement of the low field region

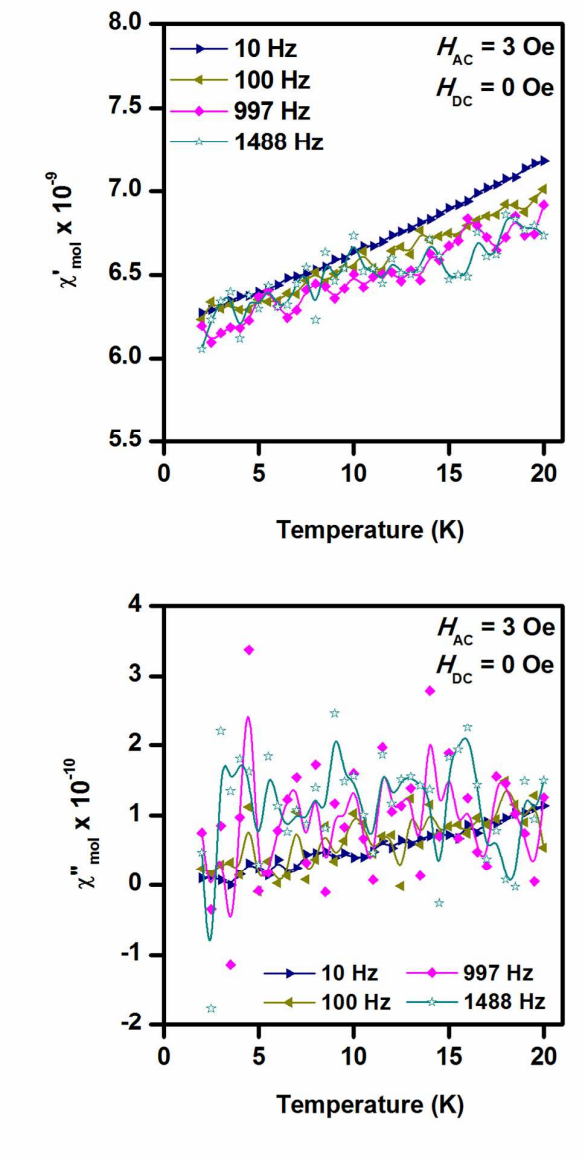

FIGURE S8. AC susceptibility measurements of the functionalized MWCNT-COOH at 4 frequencies (10 Hz, 100 Hz, 997 Hz, 1488 Hz) using H_{AC} = 3 Oe, H_{DC} = 0 Oe