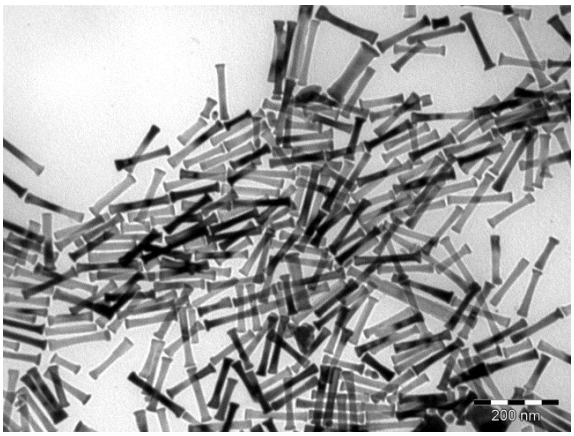
Electronic Supplementary Material (ESI) for Nanoscale.

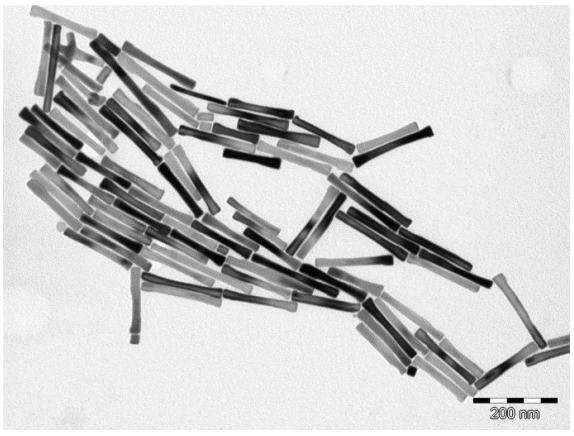
SUPPORTING INFORMATION

Dense arrays of cobalt nanorods as rare-earth free permanent magnets

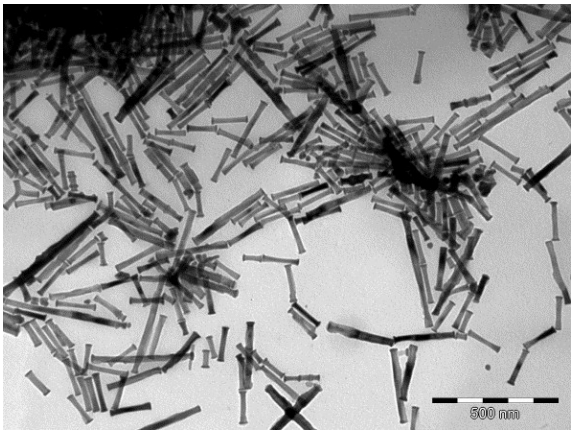
E. Anagnostopoulou,[a] B. Grindi, [a] L.-M. Lacroix, [a] F. Ott,[b] I. Panagiotopoulos,[c] G. Viau[a,]*



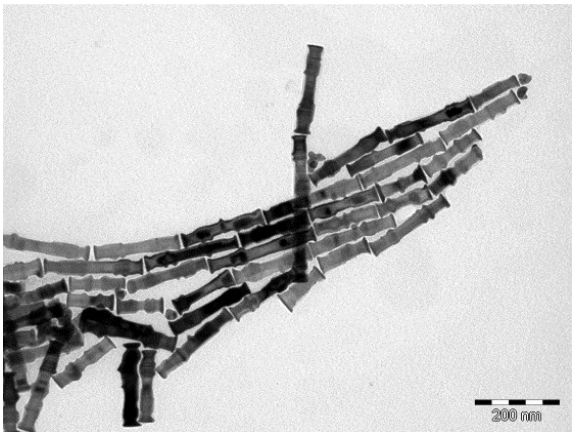
Sample R_{17} (d_m = 17.5 nm, L_m=120 nm)



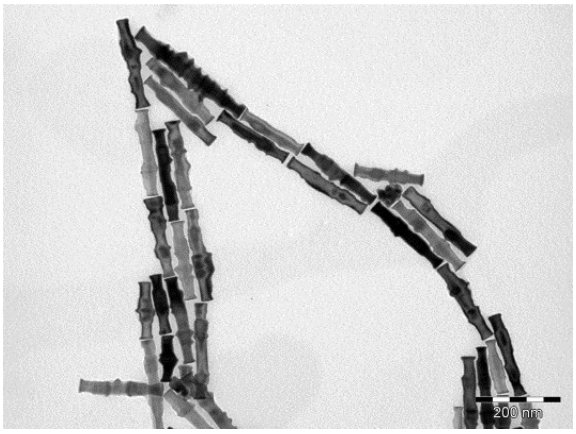
Sample R_{22} (d_m = 22 nm, L_m=166 nm)



Sample R_{24} (d_m = 24 nm, L_m=190 nm)



Sample R_{28} (d_m = 28 nm, L_m = 190 nm)



Sample R_{31} (d_m = 31 nm, L_m = 190 nm)

Fig. S1 Transmission electron microscopy images of cobalt nanorods prepared by the polyol process, mean diameter, d_m, mean length, L_m. Scale bars denote 200 nm.

Tab. S1 Details on the rod washing prior to their alignment and drying and squareness of the *M(H)* loop after alignment.

- A1 and A2 (standard procedure): the rods were washed three times before their dispersion in chloroform and alignment ;
- A3: several additional washings were done;
- A4: alignment of large scale samples, the washing of the rods was lower than the standard procedure.

Sample	d_m/L_m (nm)	Washing Solvent	Washing procedure	*SQ*
$R_{17}A1$	17.5/120	chloroform	standard	0.86
$R_{17}A2$	17.5/120	toluene	standard	0.75
$R_{22}A1$	22/166	chloroform	standard	0.93
$R_{22}A2$	22/166	toluene	standard	0.79
$R_{22}A3$	22/166	chloroform	extended	0.96
$R_{24}A2$	24/190	toluene	standard	0.74
$R_{28}A2$	28/190	toluene	standard	0.81
$R_{28}A4$	28/190	toluene	limited	0.57
$R_{31}A4$	31/190	toluene	limited	0.69

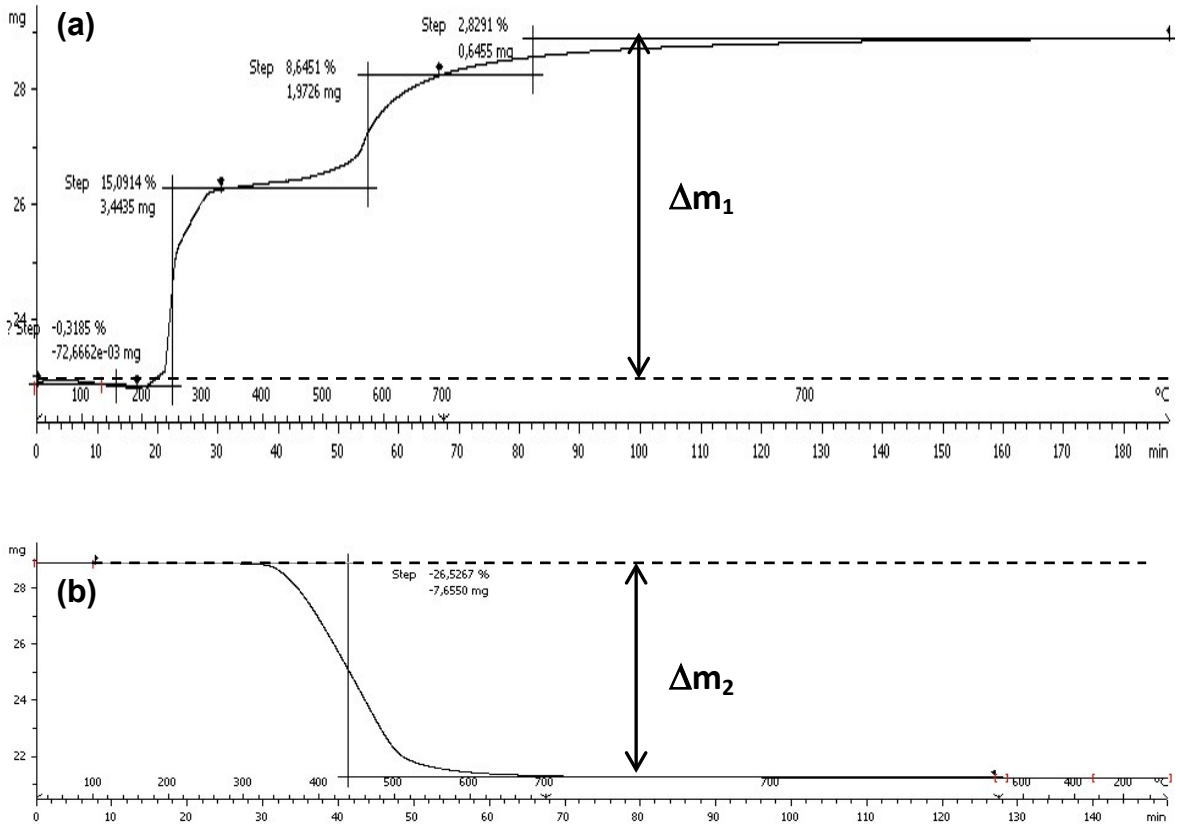


Fig. S2 Thermogravimetric analysis of m_0 = 22.8 mg of the sample $R_{31}A4$ (a) oxidation in air up to 700°C associated with a mass gain Δm_1 = +5.99 mg followed by (b) reduction at 700°C in H_2/Ar = 4/96 atmosphere associated with the mass loss Δm_2 = -7.65 mg. The cobalt mass fraction in this sample is $\%w(Co_{total}) = (m_0 + \Delta m_1 + \Delta m_2)/m_0$ = 92.7%

Note that the presence of residual solvent in the needles can be observed in the first TGA measurement where a mass loss is observed at temperatures as low as 80°C which do not correspond to organic matter calcination but to simple solvent evaporation.