Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting information

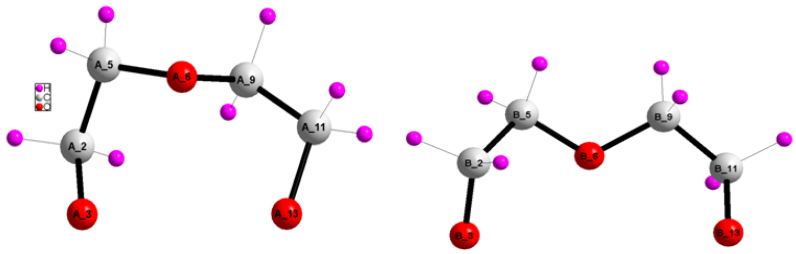

Figure S1. Diethyleneglycolate coordination mode on the Eu and Co metal cations (deg_A on left and deg_B on right). O and C atoms are in red and light grey, respectively.

Table S1. 'Relaxed' geometrical parameters of deg_A and deg_B molecules used in the Rietveld refinement of CoEu-based complex

deg_A		deg_B	
Atoms	Distances (Å)	Atoms	Distances (Å)
A_3-A_2	1.402	B_3-B_2	1.396
A_2-A_5	1.516	B_2-B_5	1.491
A_5-A_6	1.419	B_5-B_6	1.419
A_6-A_9	1.408	B_6-B_9	1.436
A_9-A_11	1.492	B_9-B_11	1.493
A_11_A13	1.505	B_11-B_13	1.428
	Angles (°)		Angles (°)
A_3-A_2-A_5	111.65	B_3-B_2-B_5	114.97
A_2-A_5-A_6	108.78	B_2-B_5-B_6	107.1
A_5-A_6-A_9	113.88	B_5-B_6-B_9	115.66
A_6-A_9-A_11	106.85	B_6-B_9-B_11	107.69
A_9-A_11-A_13	110.84	B_9-B_11-B_13	109.63

Table S2. Fractional atomic coordinates of the CoEu-based complex

Code Atom	Atom	X	Y	Z	U
A_1	H	0.35210	0.70794	0.60945	0.0558(33)
A_2	C	0.38471	0.72296	0.56574	0.0558(33)
A_3	O	0.46067	0.65622	0.60626	0.0558(33)
A_4	H	0.33724	0.69895	0.48272	0.0558(33)
A_5	C	0.40422	0.85089	0.57050	0.0558(33)
A_6	O	0.45283	0.87030	0.52221	0.0558(33)
A_7	H	0.44083	0.87931	0.65386	0.0558(33)
A_8	H	0.34930	0.89440	0.53440	0.0558(33)
A_9	C	0.40271	0.86393	0.41146	0.0558(33)
A_10	H	0.35175	0.79626	0.38311	0.0558(33)
A_11	C	0.46421	0.83605	0.37642	0.0558(33)
A_12	H	0.36946	0.94651	0.37567	0.0558(33)
A_13	O	0.51184	0.72488	0.42515	0.0558(33)
A_14	H	0.50937	0.90939	0.39592	0.0558(33)
A_15	H	0.42654	0.82537	0.28992	0.0558(33)
B_1	H	0.69258	0.64037	0.29361	0.0387(29)
B_2	C	0.66228	0.62952	0.34054	0.0387(29)
B_3	O	0.58888	0.55945	0.28326	0.0387(29)
B_4	H	0.64232	0.71669	0.35037	0.0387(29)
B_5	C	0.72970	0.58391	0.44620	0.0387(29)
B_6	O	0.68502	0.54137	0.49398	0.0387(29)
B_7	H	0.76220	0.52450	0.43780	0.0387(29)
B_8	H	0.77596	0.65314	0.49389	0.0387(29)
B_9	C	0.72411	0.56828	0.60368	0.0387(29)
B_10	H	0.79162	0.53503	0.65140	0.0387(29)
B_11	C	0.66993	0.51312	0.64020	0.0387(29)
B_12	H	0.72671	0.66237	0.61710	0.0387(29)
B_13	O	0.58191	0.55279	0.57712	0.0387(29)
B_14	H	0.69794	0.53525	0.72404	0.0387(29)
B_15	H	0.67348	0.41901	0.63465	0.0387(29)
Eu	Eu	0.97764(9)	0.03876(13)	0.11280(12)	0.0066(9)
Co	Co	0.04284(24)	-0.21920(32)	0.07607(30)	0.007(2)
Cl	Cl	0.15963(44)	0.31010(59)	0.70874(54)	0.0630(32)

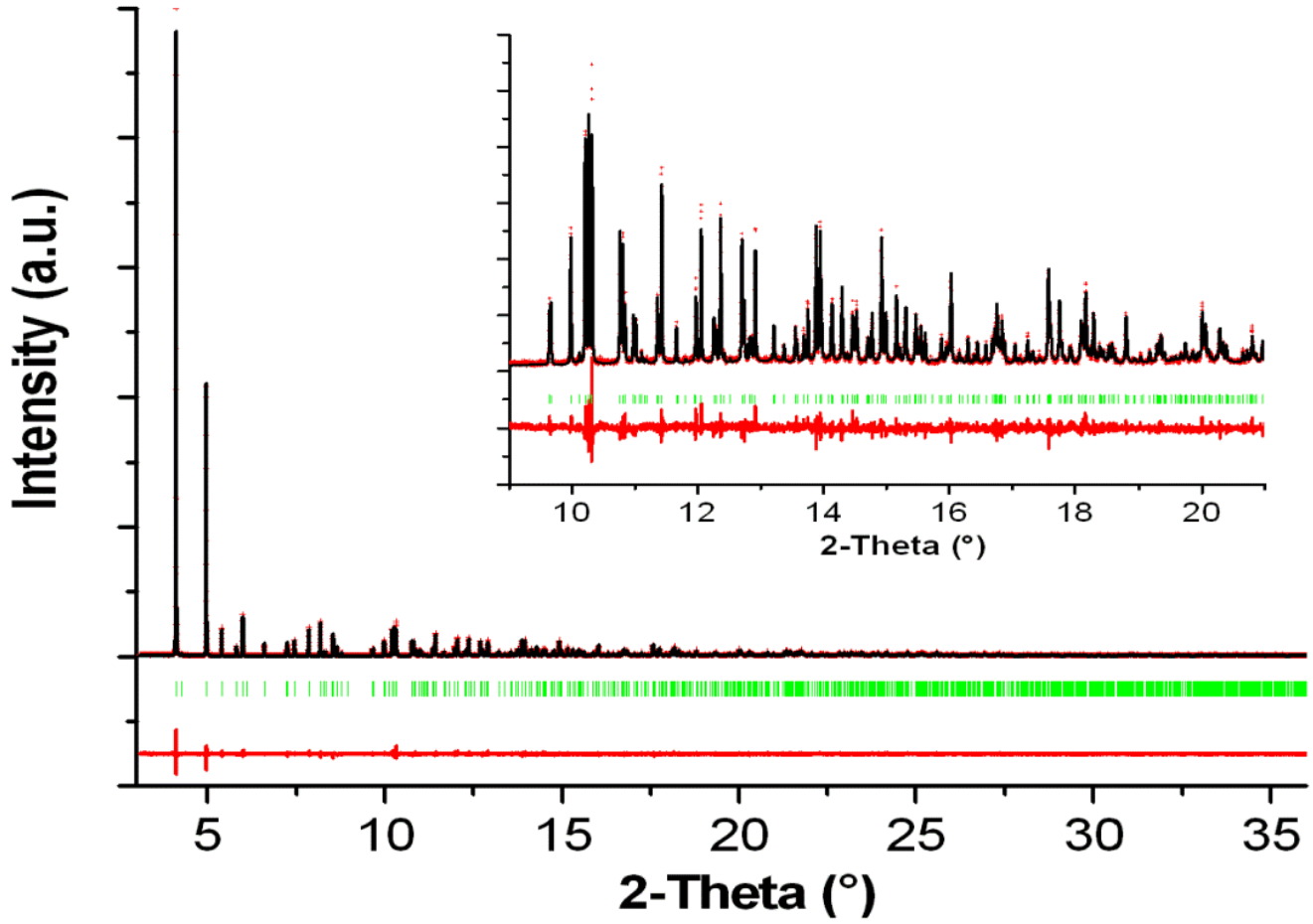

Figure S2. Experimental and Rietveld refined XRD pattern of the as-produced CoEu based-complex superposed to the experimental one recorded on synchrotron facilities.

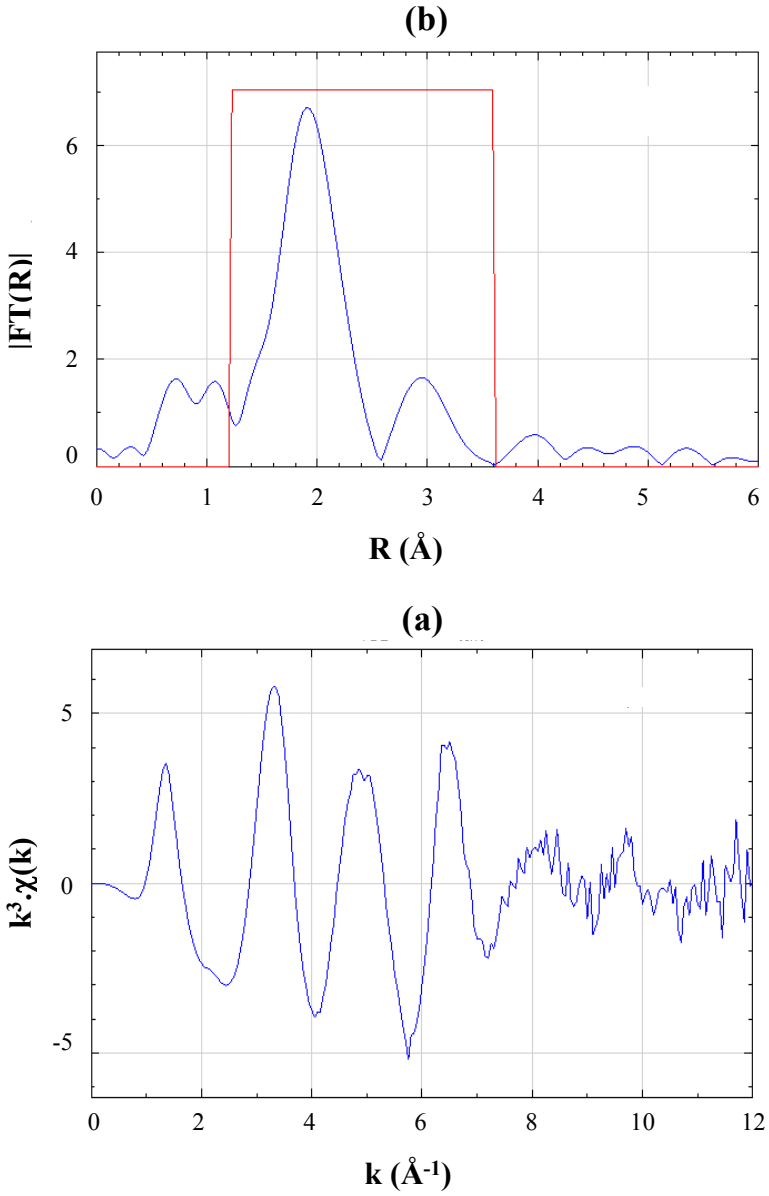

Figure S3. k^3-weighted total EXAFS interference function as a function of the wavevector k of the photoelectron (a) and the Moduli of the Fourier transforms of the EXAFS (not corrected from the electron phase shift) (b), at L_3 threshold of Eu in in the CoEu-based complex. The filter window related to the first back-scatterer atom shells was plotted in red on the FT moduli curve.

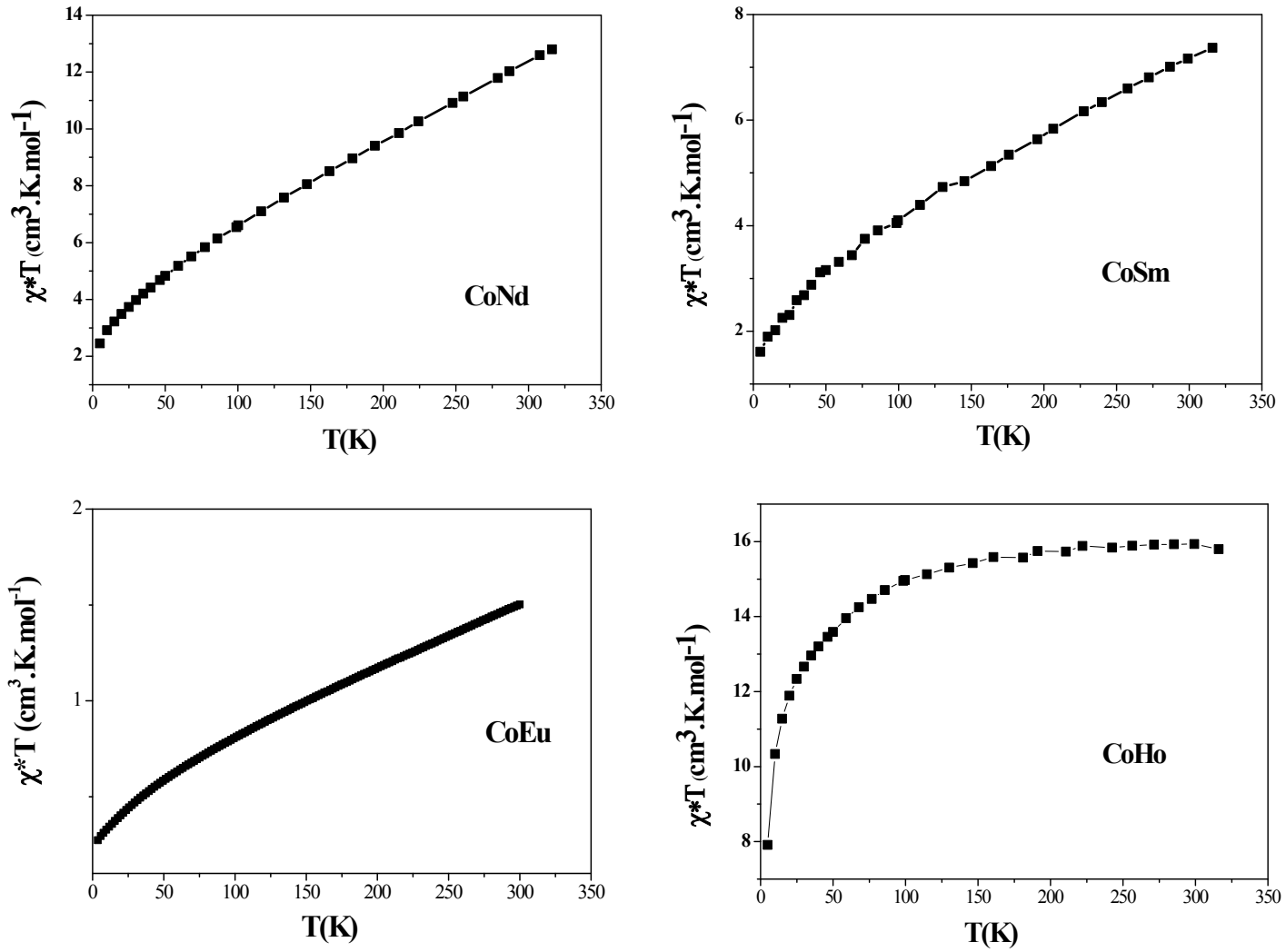

Figure S4. The temperature dependence of the product χ.T of $CoLnCl(deg)_2$, Ln =Nd, Sm, Eu and Ho, as collected under a field of 500 Oe.

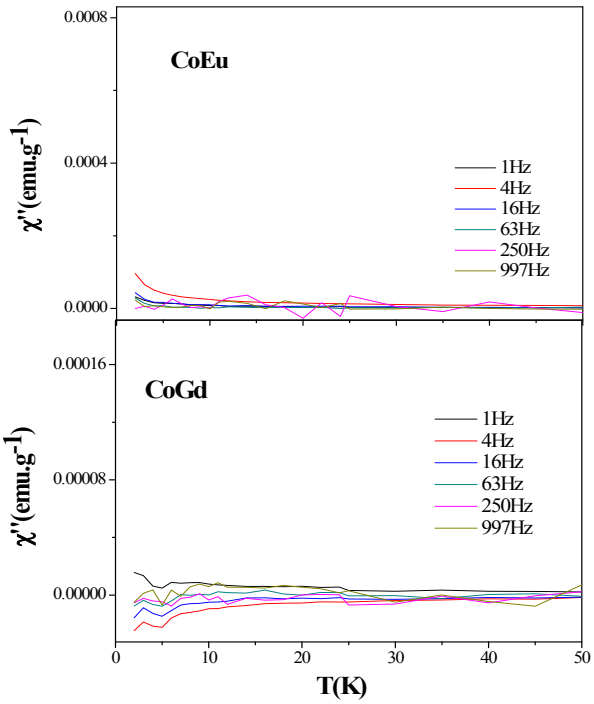

Figure S5. Thermal variation of the out-of-plane ac-susceptibility (χ'') of $CoEuCl(deg)_2$ and $CoGdCl(deg)_2$, for frequencies ranging between 1 and 1000 Hz.