SUPPORTING INFORMATION

Monitoring Spin-Crossover phenomena via Re(I) luminescence in hybrid Fe(II) silica coated nanoparticles

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1.- X-Ray Powder Diffraction Analysis.

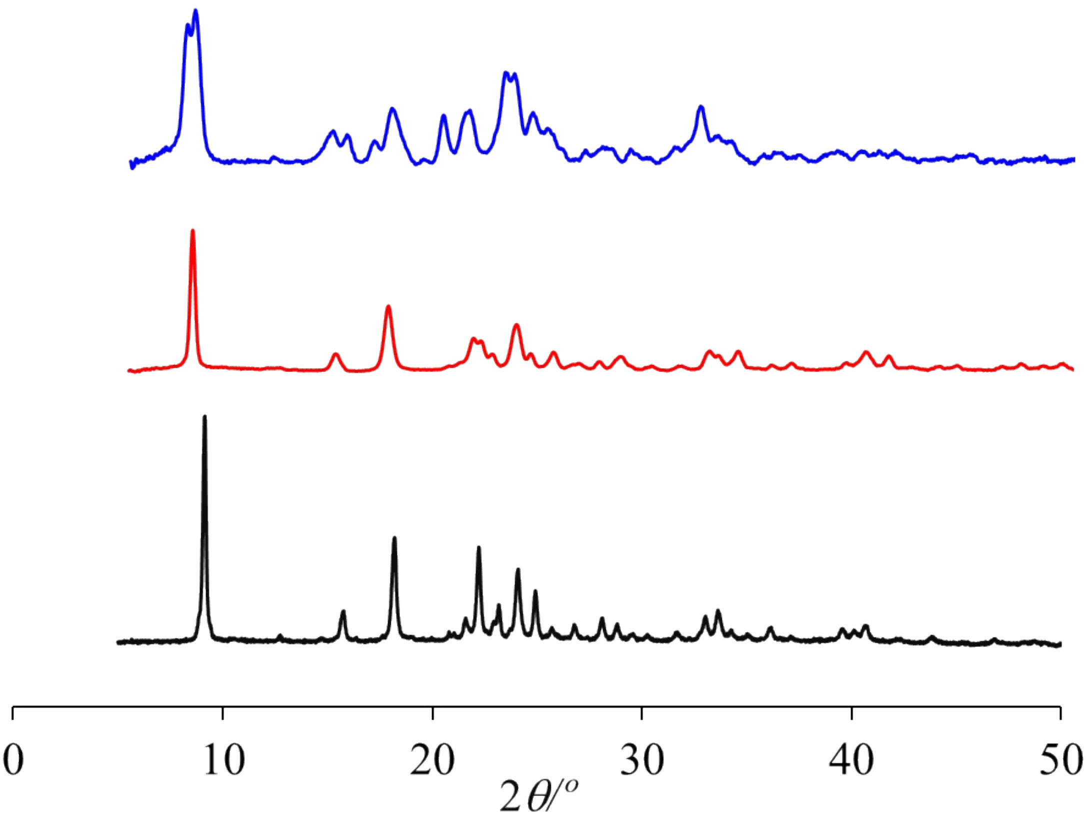

Figure S1. Experimental XRPD diagrams for bulk $[Fe(NH_2\text{-}Trz)_3](BF_4)_2$ polymer (black) and samples **1** (red) and **1@SiO$_2$** (blue).

2.- Elemental Analysis.

The molecular weights determined by elemental analysis were considered to determine the molar magnetic susceptibility.

Sample		C [%]	N [%]	H [%]	Proposed Formula
1	Found	14.70	33.11	3.17	$[Fe(NH_2Trz)_3](BF_4)_2 \cdot H_2O$
	calcd	14.39	33.60	2.82	MW = 500.08 $gmol^{-1}$
1@SiO$_2$	Found	12.29	28.51	2.87	$[Fe(NH_2Trz)_3](BF_4)_2 \cdot (SiO_2)_{1.5} \cdot H_2O$
	calcd	12.20	28.48	2.39	MW = 590.03 $gmol^{-1}$
1@SiO$_2$/Re	Found	14.85	28.79	2.98	-----
	calcd	---	---	---	

Table S1.- Elemental analyses for samples **1**, **1@SiO$_2$** and **1@SiO$_2$/Re.**

3.- NMR characterization.

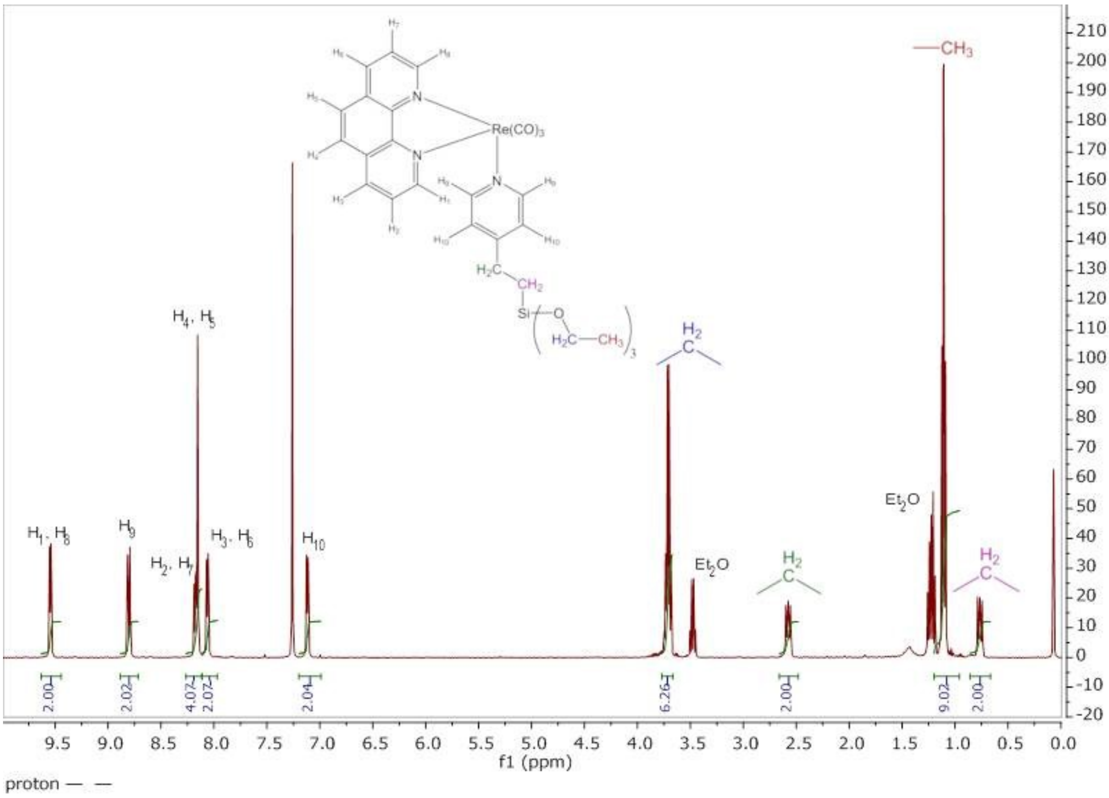

Figure S2.- ^{1}H-NMR spectrum of **Re** in CD_3Cl.

4.- Kinetics for Time-resolved photoluminescence of Re and 1@SiO$_2$/Re.

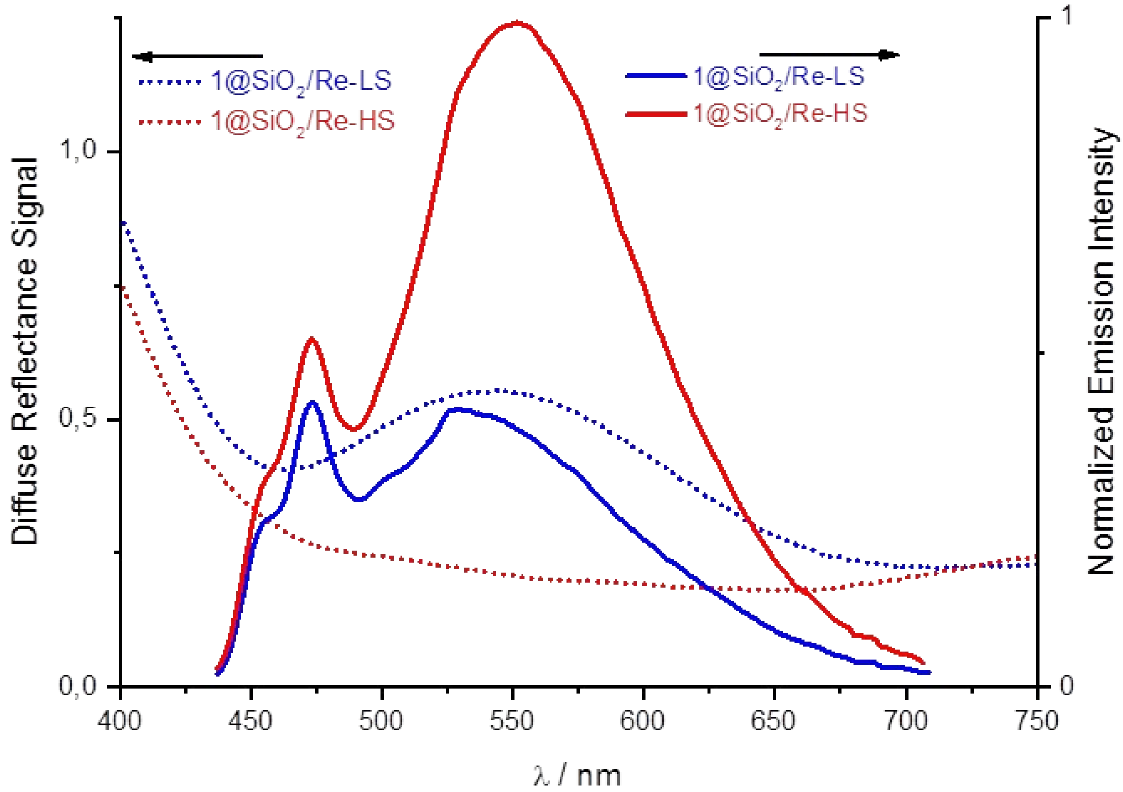

Figure S3.- Diffuse reflectance (dotted lines) and Emission (full lines) spectra of **1@SiO$_2$/Re** measured at T = 280 K (blue) and T = 330 K (red).

Solid state samples were excited at $\lambda_{exc.}$ = 350 nm at two different temperatures, T = 273 K and T = 330 K. Decays were fitted to the two or three-exponential functions:

$$I = A_1 e^{-\frac{t}{\tau_1}} + A_2 e^{-\frac{t}{\tau_2}} + y_0 \qquad \text{eq. 1}$$

$$I = A_1 e^{-\frac{t}{\tau_1}} + A_2 e^{-\frac{t}{\tau_2}} + A_3 e^{-\frac{t}{\tau_3}} + y_0 \qquad \text{eq. 2}$$

The mean lifetime value was calculated as:

$$\tau_{mean} = \frac{(A_1 \times \tau_1 + A_2 \times \tau_2 + \ldots)}{(A_1 + A_2 + \ldots)} \qquad \text{eq. 3}$$

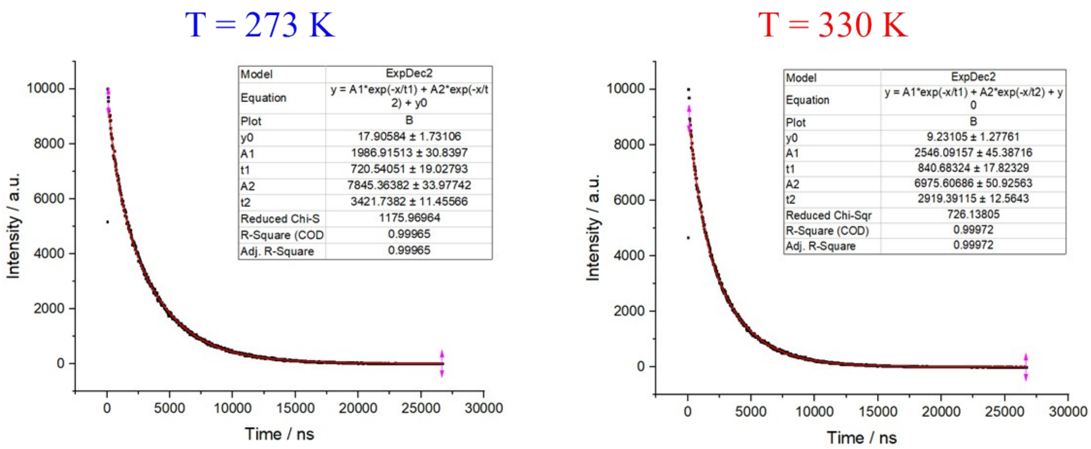

Figure S4.- Excited state decay profiles of **Re** at 273 and 330 K (black dots) and biexponential fits (red).

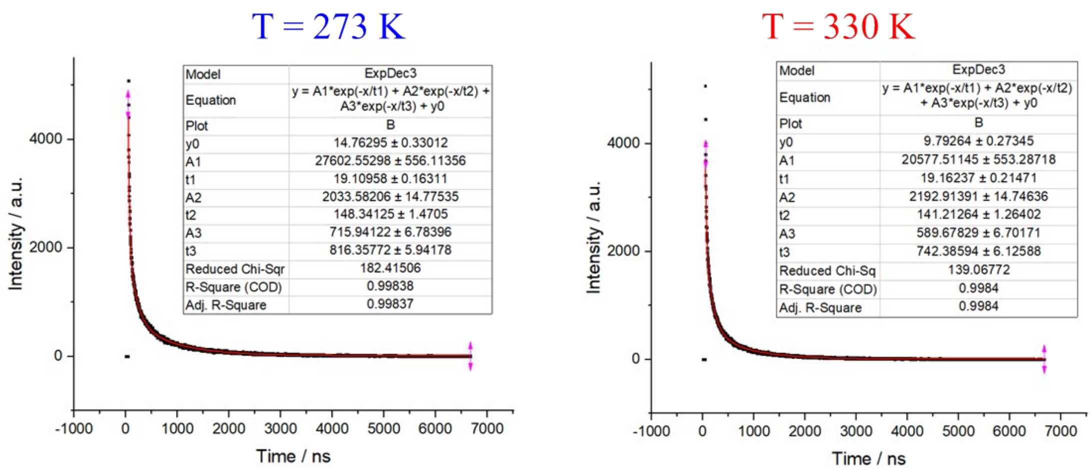

Figure S5.- Excited state decay profiles of **1@SiO$_2$/Re** at 273 and 330 K (black dots) and biexponential fits (red).

Compounds	τ_1 / ns	τ_2 / ns	τ_3 / ns	*A1*	*A2*	*A3*	τ_{mean}/ns
Re (T = 273K)	720	3421	---	1986	7845	---	2875
Re (T = 330 K)	788	2896	---	2502	7083	---	2346
1@SiO$_2$/Re (T 273K)	17	131	780	28626	1798	620	39
1@SiO$_2$/Re (T 330K)	15	127	701	37848	2390	701	33

Table S2. Excited-state lifetimes (λ_{ex} = 395nm) of **Re** and **1@SiO$_2$/Re** in the solid state at T = 273 K and T = 330 K.

6.- Magnetic Properties of sample 1@SiO_2/Re.

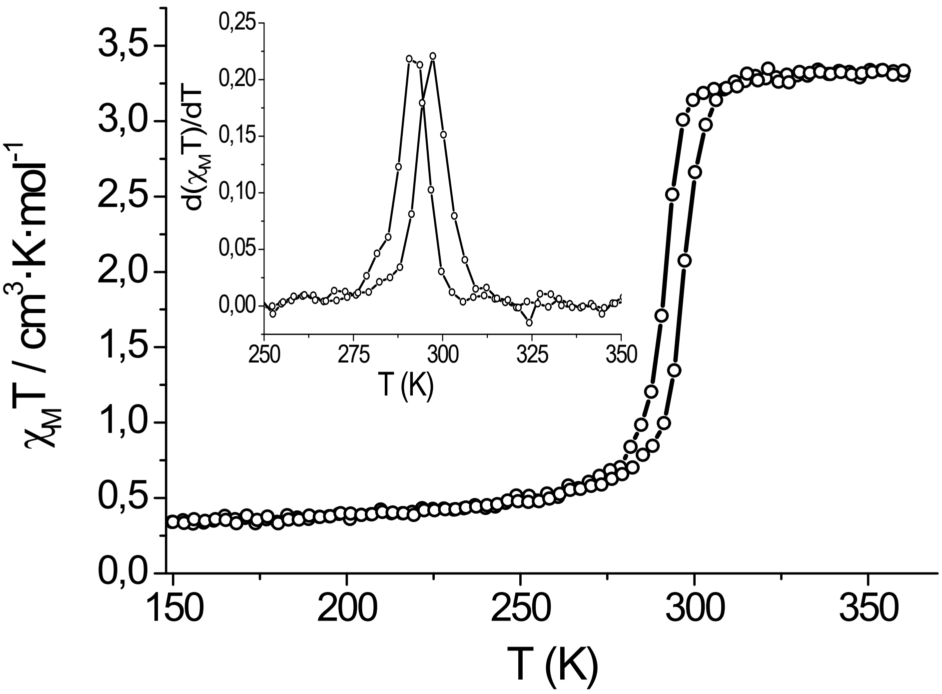

Figure S6. Thermal dependence of the $\chi_M T$ product for sample **1@SiO_2/Re** under an applied magnetic field H_{dc} = 1 T.

3.- Thermal dependence of the excitation spectrum for sample 1@SiO_2/Re.

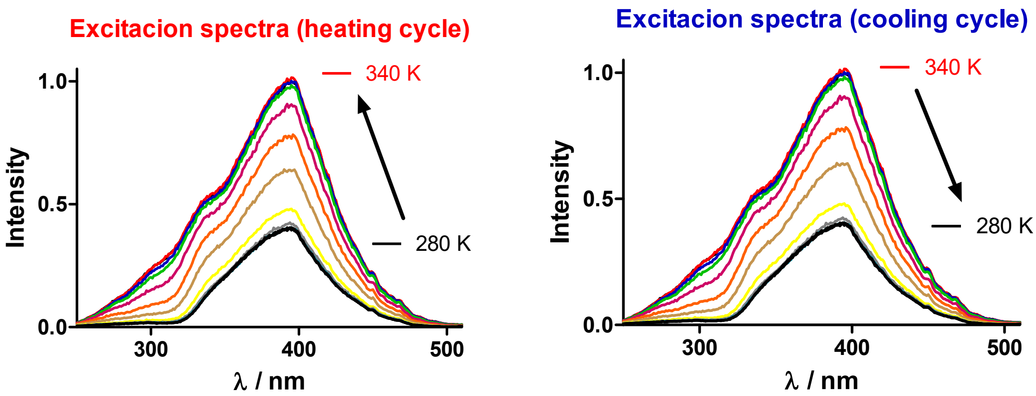

Figure S7.- Variation of the excitation spectra of **1@SiO_2** upon heating (left) and cooling (right) cycles.