Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

SUPPORTING INFORMATION

Electronic communication between fluorescent pyrene excimers and spin crossover complexes in nanocomposite particles

Iurii Suleimanov[a,b], Olena Kraieva[a,c], José Sanchez Costa[a], Igor O. Fritsky[b], Gábor Molnár[a], Lionel Salmon*[,a], and Azzedine Bousseksou*[,a]

[a]Laboratoire de Chimie de Coordination, CNRS & Université de Toulouse (INPT, UPS), 31077 Toulouse, France
[b]Department of Chemistry, Taras Shevchenko National University of Kyiv, 01601 Kyiv, Ukraine
[c]Kyiv Polytechnic Institute, National Technical University of Ukraine, 03056 Kyiv, Ukraine

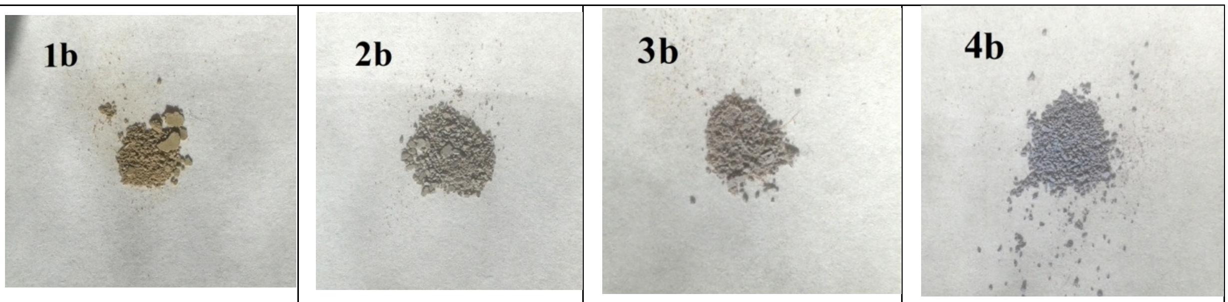

Fig S1. Images of **1b-4b** showing colour change for different fluorophor quantities.

Table S1: Reagent quantities used to prepare 1a-4a.

Samples	Oil phase (ml)			Polar phase (ml)	Reagents (mg)			Mean size (nm)	
	Triton	Hexanol	Cyclohexane	H_2O	$Fe(BF_4)_2$*	TEOS**	Htrz	Length	Width
1a	7.2	7.2	15	2	422	0.2	262	60	40
2a	7.2	7.2	30	2	422	0.2	262	110	80
3a	7.2	7.2	30	2	422	0.2	262	110	80
4a	7.2	7.2	40	2	422	0.2	262	150	90

* hydrated form with six H_2O molecules
** measured in ml

Table S2: Fluorophore quantities in 1b-4b.

Samples	Fluorophor quantity found (% mas.)	Fluorophor quantity added (mg/% mas.)
1b	38	100/50
2b	11	60/37.5
3b	4.2	20/16.7
4b	1.7	10/9

Table S3. C, H, N analysis for 1b-4b.

Compound		C / %	H / %	N / %	Calculated Formula
1b	exptl	37.53	2.97	20.43	$[Fe(H\text{-}trz)_2(trz)](BF_4)\cdot(SiO_2)_{0.4}(C_{20}H_{16}NSiO_3)_{0.72}\cdot(H_2O)_{1.5}$
		37.56	2.97	20.29	
	calcd	37.56	3.45	20.89	
2b	exptl	23.85	2.11	29.13	$[Fe(H\text{-}trz)_2(trz)](BF_4)\cdot(SiO_2)_{0.4}(C_{20}H_{16}NSiO_3)_{0.14}\cdot(H_2O)_{1.3}$
		23.85	2.13	29.03	
	calcd	23.71	2.88	28.7	
3b	exptl	20.71	2.06	30.48	$[Fe(H\text{-}trz)_2(trz)](BF_4)\cdot(SiO_2)_{0.4}(C_{20}H_{16}NSiO_3)_{0.05}\cdot(H_2O)_{1.3}$
		20.59	2.04	30.27	
	calcd	20.29	2.75	30.6	
4b	exptl	19.09	2.0	31.70	$[Fe(H\text{-}trz)_2(trz)](BF_4)\cdot(SiO_2)_{0.4}(C_{20}H_{16}NSiO_3)_{0.02}\cdot(H_2O)_{1.3}$
		19.03	1.94	31.68	
	calcd	19.03	2.7	31.29	

TEM images and particle size distribution

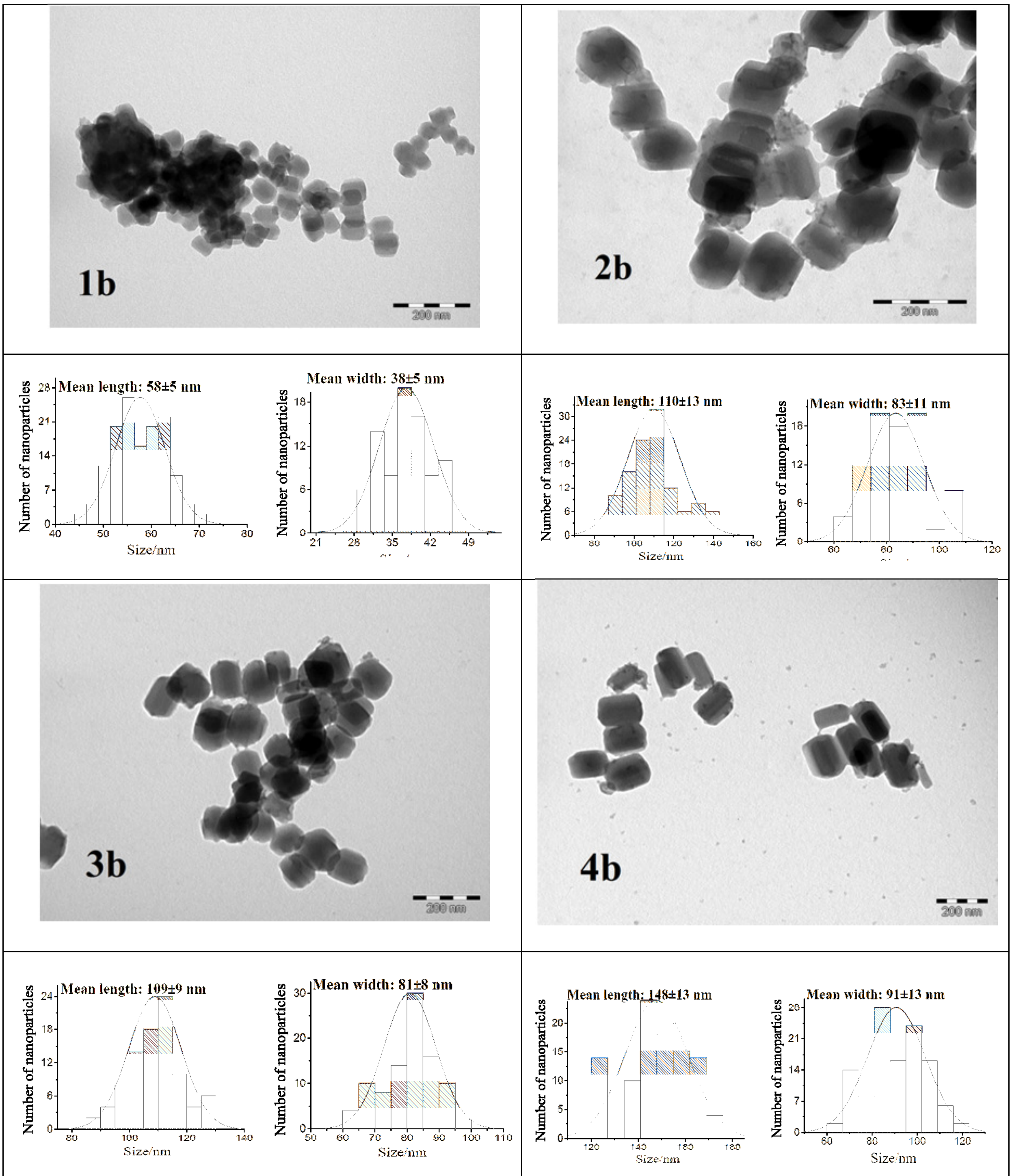

Fig. S2 TEM images of the fluorescent nanocomposites**1b-4b** and their length and width distributions.

Infrared spectra

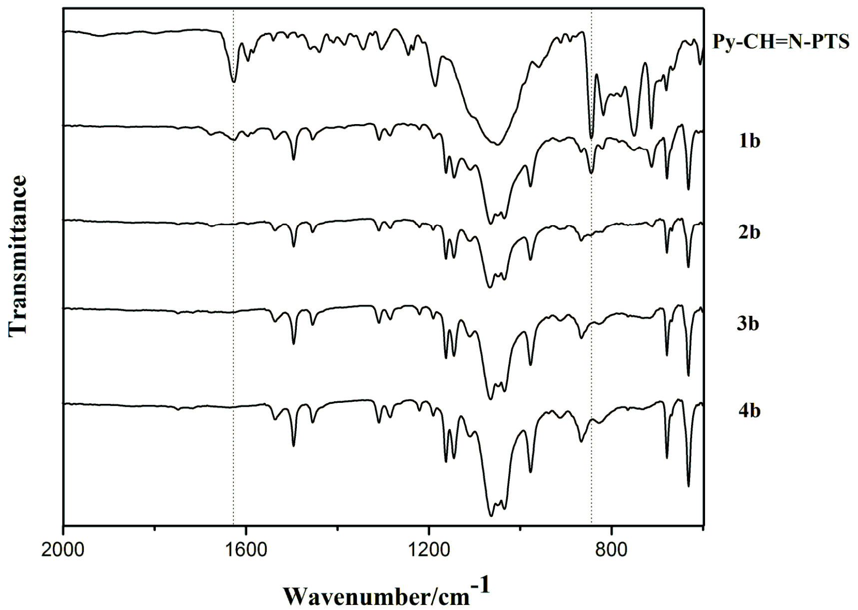

Fig. S3 Infrared spectra of the fluorophore (**Py-CH=N-PTS**) and the luminescent nanoparticles (**1b-4b**)

Magnetic measurements

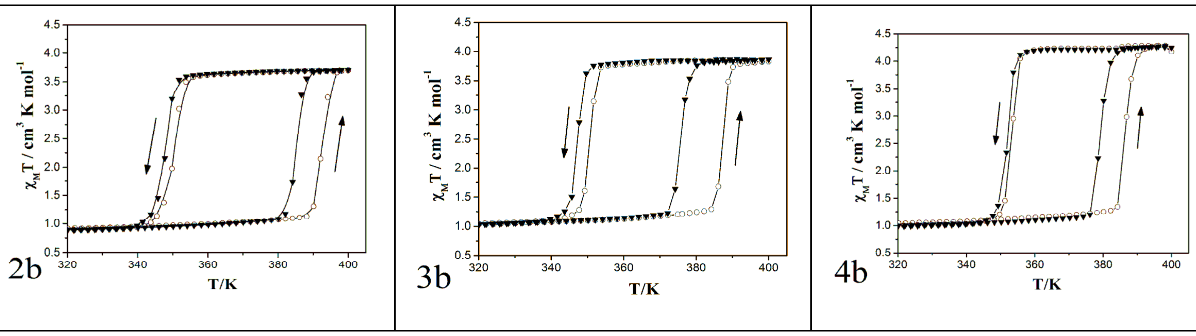

Fig. S4 Variable temperature magnetic susceptibility measurements on samples **2b-4b**. The first cycle is plotted in empty circles, the second cycle in full triangles.

Fluorescence temperature dependence

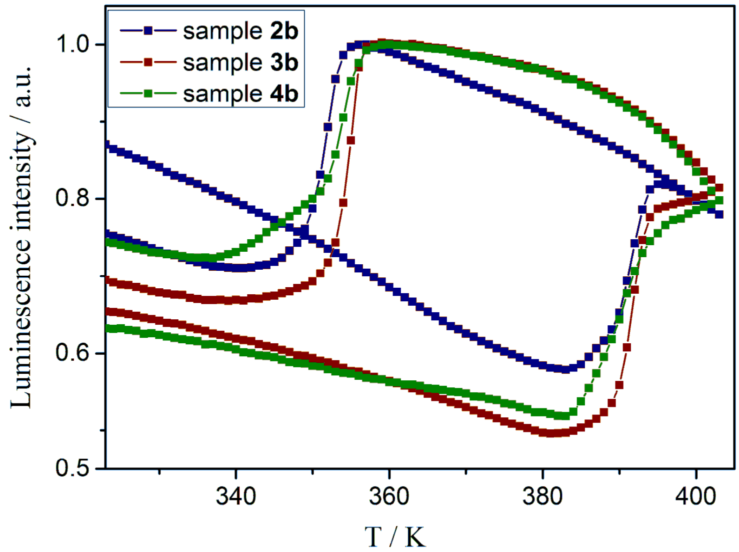

Fig. S5 Variable temperature luminescence intensity of **2b-4b** (λ_{exc} = 450 nm, λ_{em} = 550 nm).

Luminescence lifetime measurements

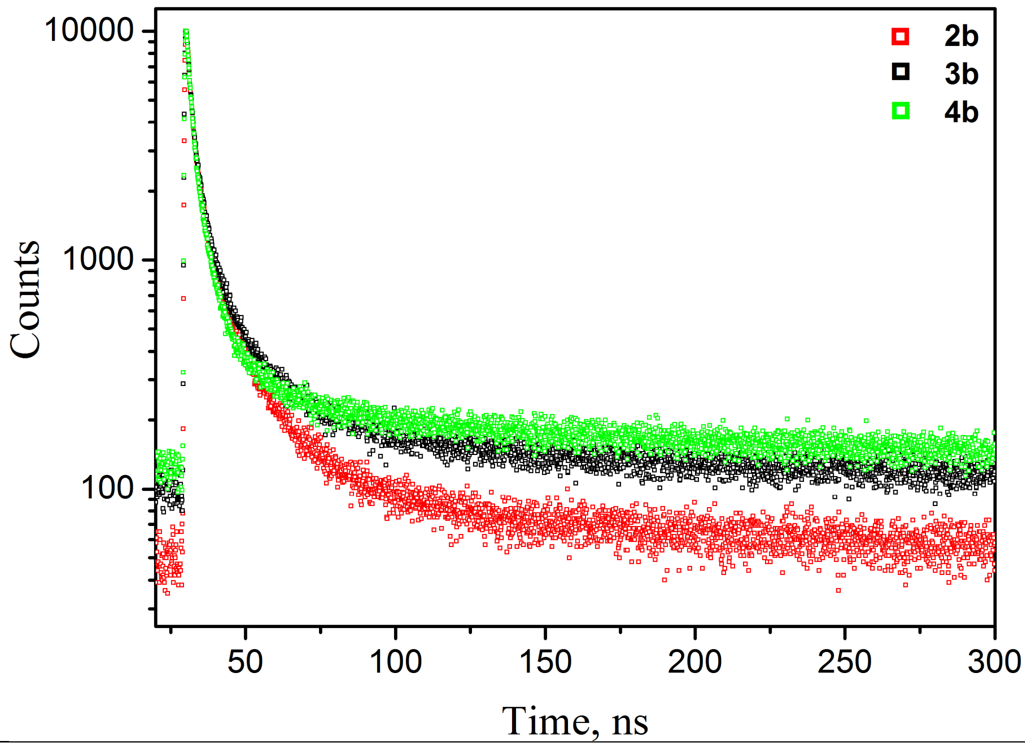

Fig. S6 Fluorescence decay curves of samples **2b-4b** (λ_{exc} = 303 nm, λ_{em} = 520 nm)

Table S4. Comparative table of spin transition temperatures (T_c↑-heating, T_c↓-cooling) measured with different methods

Sample **1b**	Magnetic susceptibility		Optical reflectivity		Fluorescence intensity		Fluorescence lifetime		Fluorescence wavelength*	
	T_c↑	T_c↓	T_c↑	T_c↓	T_c↑	T_c↓	T_c↑	T_c↓	T_c↑	T_c↓
First cycle	394	349	393	341	389	342	392	345	395	346
Second cycle	384	347	382	338	387	341	392	346	395	348

*measured for **3b**