Supporting Information

Oxygen-Proof Optical Temperature Sensing with Pristine C_{70} Encapsulated in Polymer Nanoparticles

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From the analysis of the delayed fluorescence data and using a method previously developed,[1] it is possible to obtain the singlet-triplet energy gap (ΔE_{ST}) from the temperature dependence of the $I_{\mathrm{DF}}/I_{\mathrm{PF}}$ ratio using the following equation

$$\ln\left[\frac{I_{\mathrm{PF}}}{I_{\mathrm{DF}}}-\left(\frac{1}{\Phi_{\mathrm{T}}}-1\right)\right]=\ln\left[\frac{1}{\Phi_{\mathrm{T}}}\left(\frac{1}{\Phi_{\mathrm{S}}^{\infty}}-1\right)\right]+\frac{\Delta E_{\mathrm{ST}}}{RT} \qquad \text{(eq. S1)}$$

However, the correct value of the triplet quantum yield (Φ_{T}, assumed to be temperature-independent) is required for a linear least-squares fit. The shape of the plot is very sensitive to Φ_{T} and is in general nonlinear (Figure S-1). Variation of this parameter in the search for maximum linearity yields its best value and, simultaneously, ΔE_{ST}.

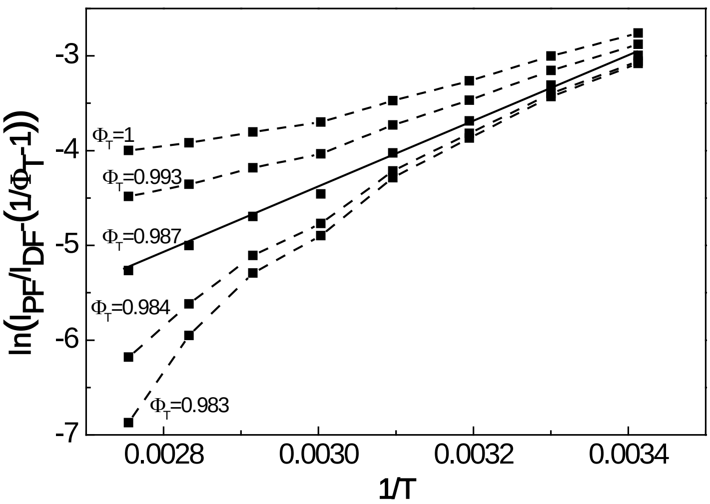

Figure S-1. Fit of ln[I_{PF}/I_{DF}-(1/Φ_T-1)] versus 1/T according to eq. S1 for a film of PS-C_{70} nanoparticles (20 ºC to 90 ºC in 10 ºC steps). The best straight line (r^2 = 0.998) is obtained for Φ_T = 0.987.

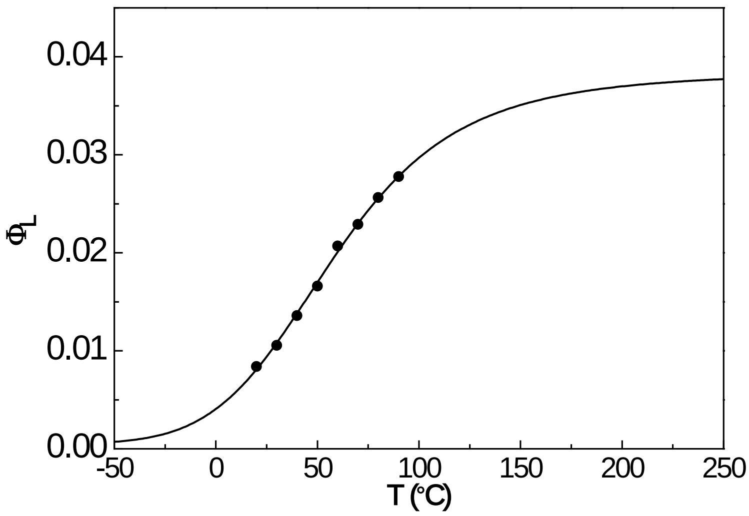

Figure S-2. Temperature dependence of the luminescence quantum yields (Φ_L) of PS-C_{70}. Experimental points are shown as circles.

References

[1] Berberan-Santos, M. N.; Garcia, J. M. M. *J. Am. Chem. Soc.* **1996**, *118*, 9391.