

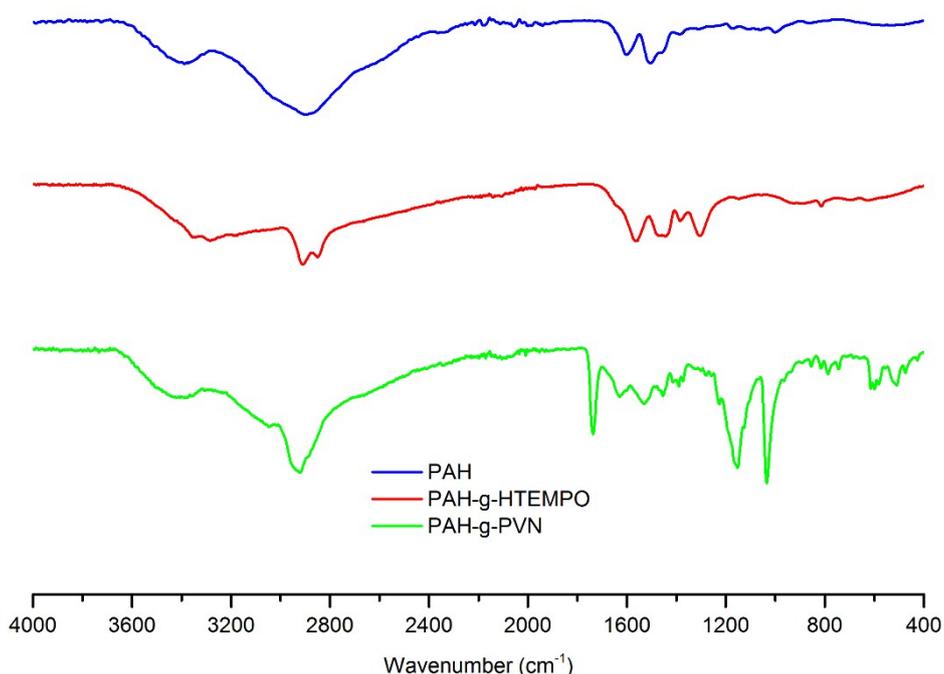
# Polymeric Nanocapsules Templated on Liquid Cores as Efficient Photoreactors

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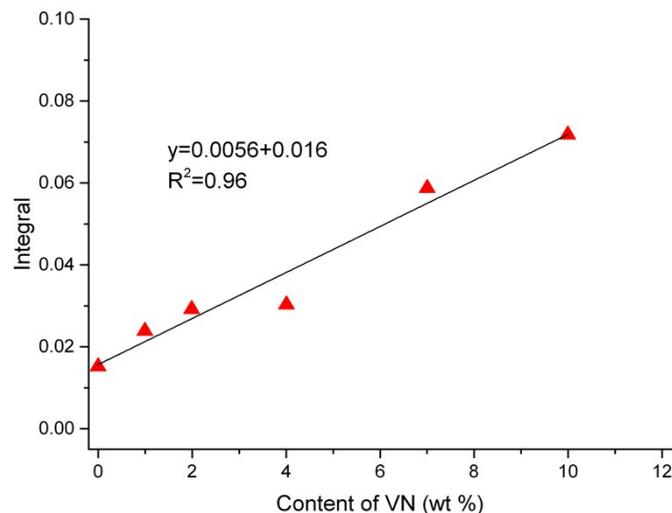
## General characterization of polymers



**Figure S1** FT-IR spectra of PAH, PAH-*graft*-HTEMPO and PAH-*graft*-PVN.

Several bands characteristic for aromatic groups could be noticed in the FT-IR spectrum of PAH-*graft*-PVN: C-H out-of-plane bending (856 cm<sup>-1</sup>, 893 cm<sup>-1</sup>, 953 cm<sup>-1</sup>), C=C stretching (1452 cm<sup>-1</sup>), C-H stretching (2921 cm<sup>-1</sup>).

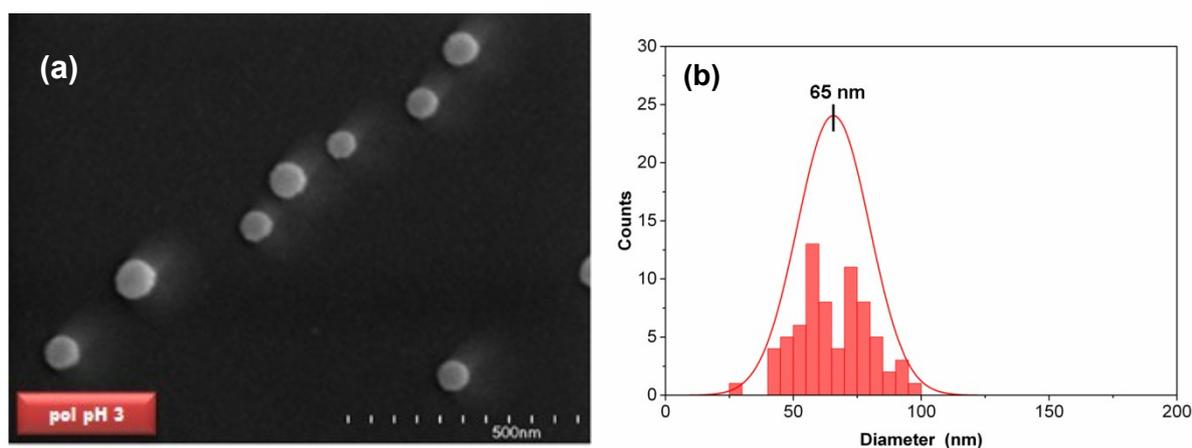
The FT-IR calibration was performed to calculate the content of VN in PAH-*graft*-PVN using the calibration curve shown in Figure S1. FT-IR spectra of series of blends of PAH and VN mixed at different weight ratios were recorded and integrated within 834 cm<sup>-1</sup>-865 cm<sup>-1</sup> range characteristic for C-H bending in aromatic rings.



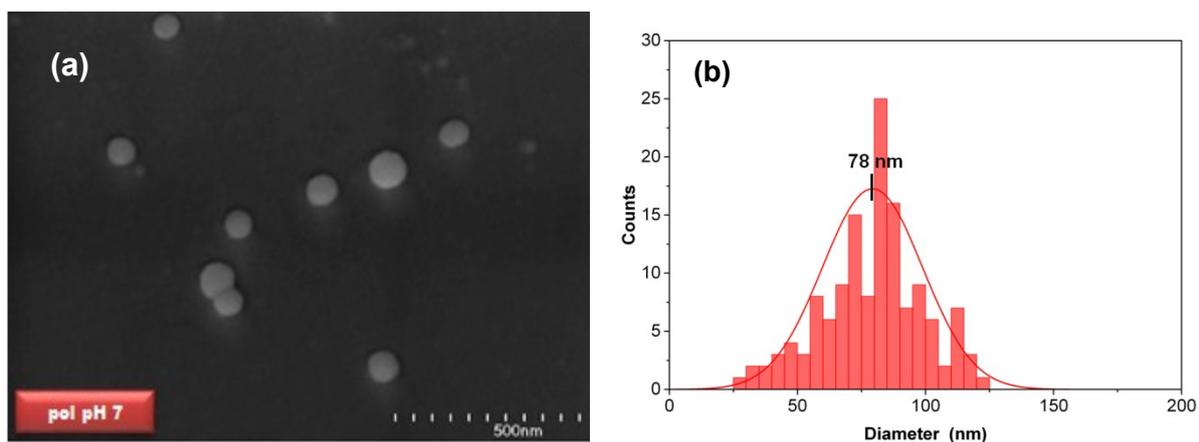
**Figure S2** Calibration curve showing the dependence of the integrals of the band in the range  $834\text{ cm}^{-1}$ -  $865\text{ cm}^{-1}$  versus the content of VN in the PAH/VN blends.

**Table S1** Number-weighted particle size of PAH-*graft*-PVN at pH= 3 and pH= 7 obtained from DLS measurements before and after heating.

Sample	Before heating		After heating	
	pH=3	pH=7	pH=3	pH=7
Diameter (nm)	$75\pm 7$	$102\pm 6$	$79\pm 5$	$94\pm 3$

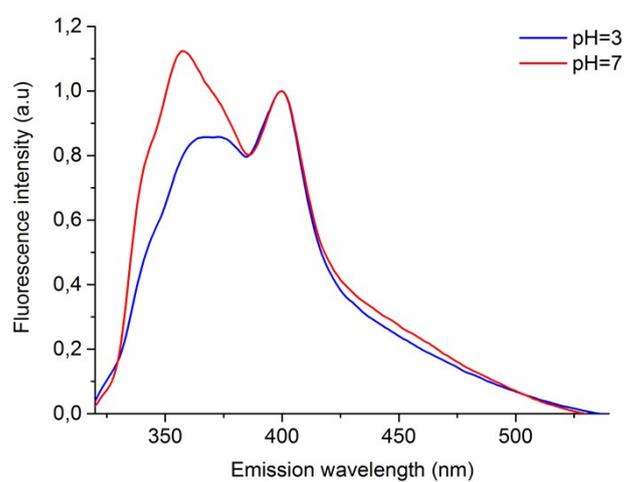


**Figure S3** SEM image of the copolymer aggregates deposited from the aqueous solution at pH=3 (a) and histogram of their size distribution (b).



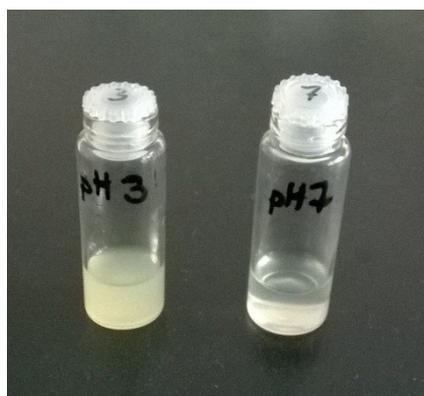
**Figure S4** SEM image of the copolymer aggregates deposited from the aqueous solution at pH=7 (a) and histogram of their size distribution (b).

### Fluorescence studies of PAH-graft-PVN

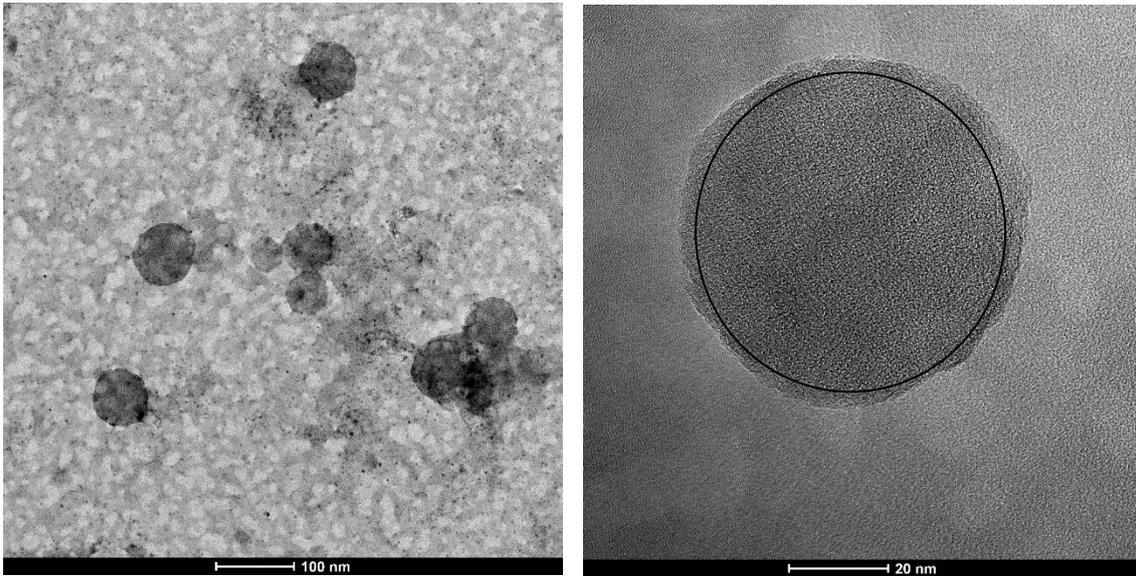


**Figure S5** Normalized steady-state emission spectra of PAH-graft-PVN solution (0.1 g/L) in 0.1 M NaCl at pH=3 and pH=7 ( $\lambda_{\text{ex}} = 280$  nm).

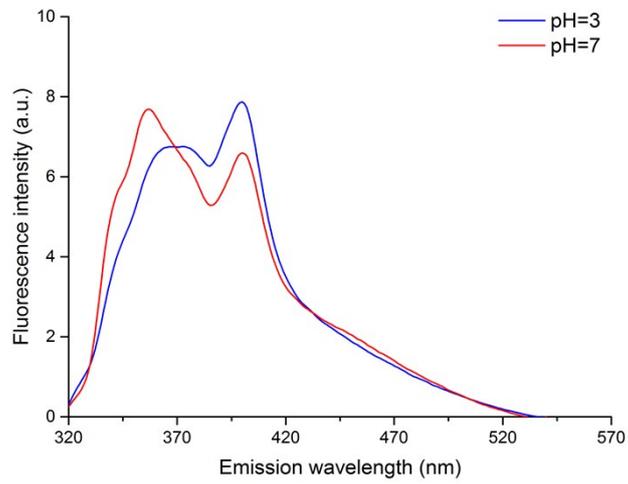
### Capsules templated on liquid cores



**Figure S6** Photographs of the capsules stabilized by PAH-graft-PVN on toluene cores at pH=3 and pH=7.

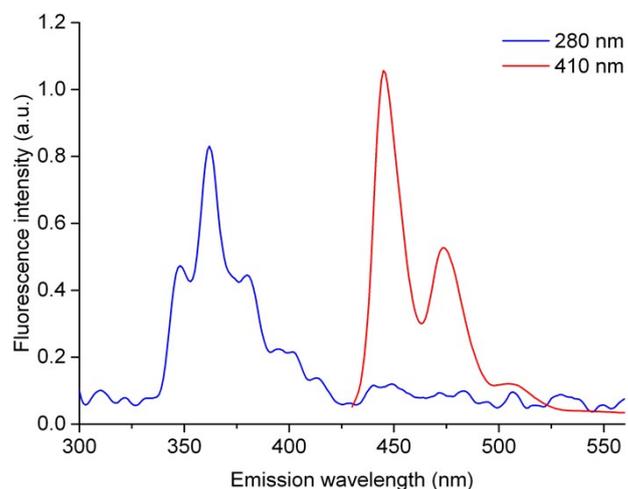


**Figure S7** TEM images of the capsules with C18/ferrocene cores deposited from their aqueous suspension.

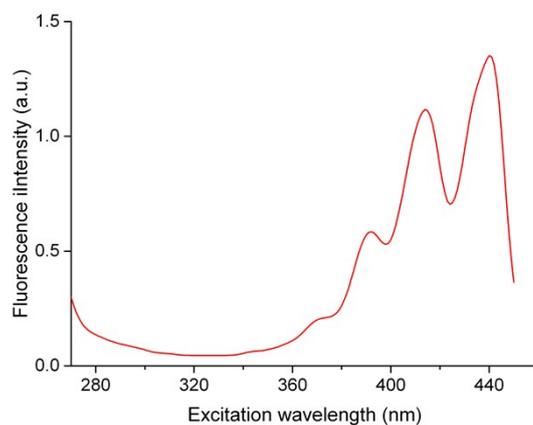


**Figure S8** Steady-state emission spectra of capsules stabilized by PAH-*graft*-PVN at pH=3 and pH=7 excited at 280 nm.

## Photophysical properties of Pe in PAH-graft-PVN aggregates and capsules



**Figure S9** Steady-state emission spectra of perylene ( $\lambda_{\text{ex}} = 410$  nm) and naphthalene ( $\lambda_{\text{ex}} = 280$  nm) in toluene solutions.



**Figure S10** Excitation spectrum of perylene dissolved in toluene ( $c=10^{-5}$ M,  $\lambda_{\text{em}} = 460$  nm).

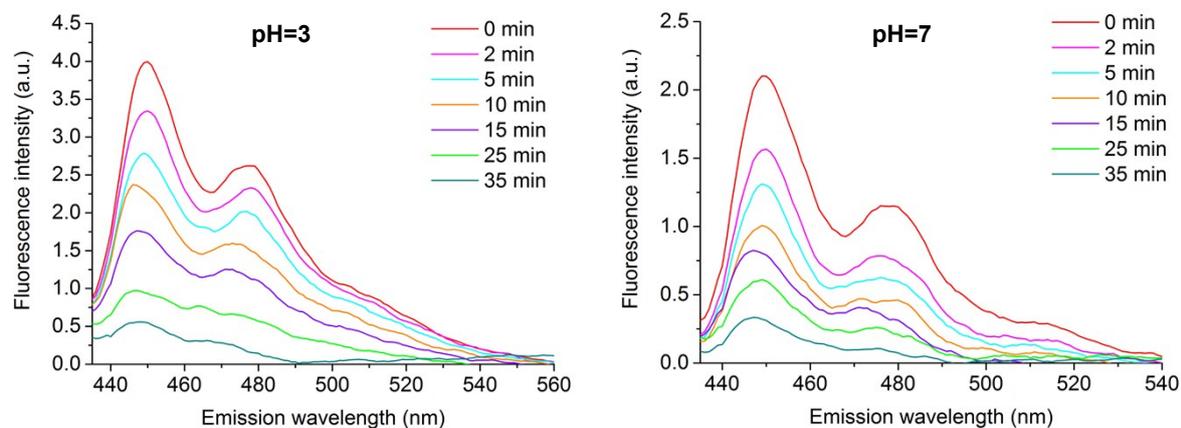
The efficiency of energy transfer was calculated using the following ratiometric equation:

$$E_{\text{rel}} = \frac{I_A}{I_A + I_D}$$

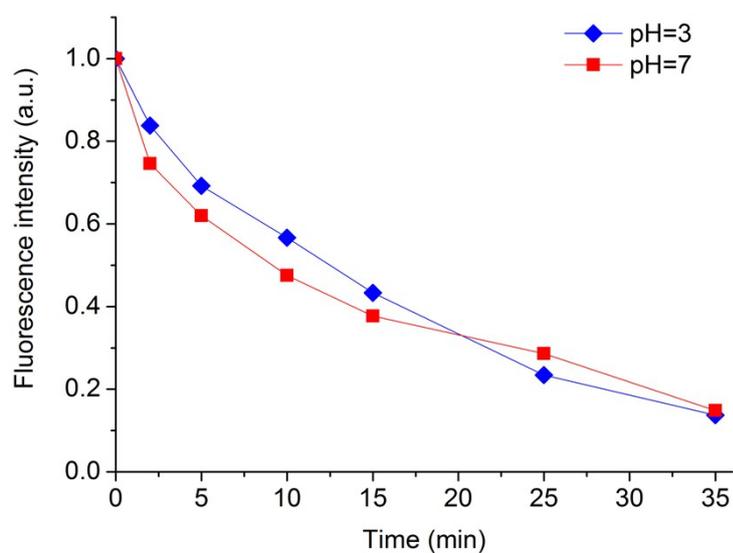
where  $I_A$  and  $I_D$  correspond to the total acceptor (A) and donor (D) fluorescence intensities.

The values of  $I_A$  and  $I_D$  were determined as appropriate integrals from the deconvoluted spectra of the aggregates or capsules (Fig. 8) into the isolated A (naphthalene) and D (perylene) components.

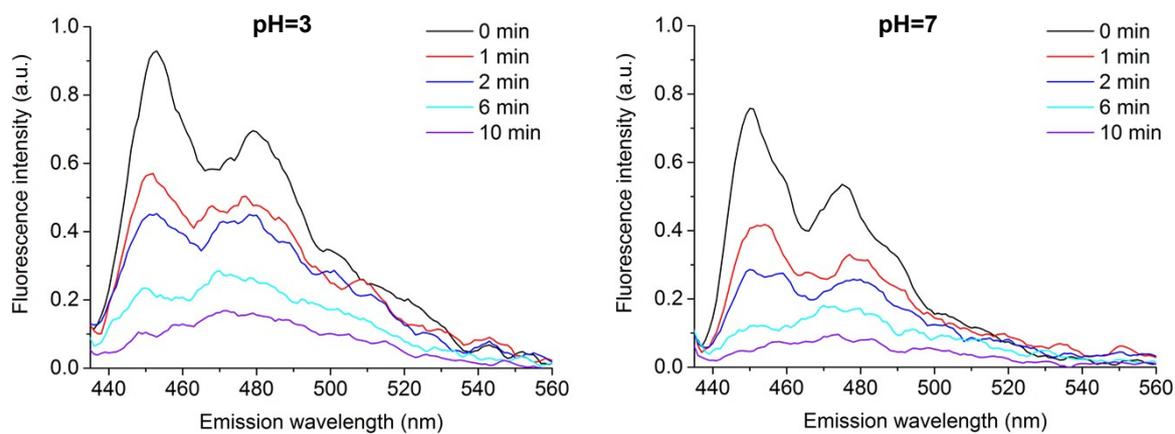
## Photooxidation of solubilized and encapsulated Pe



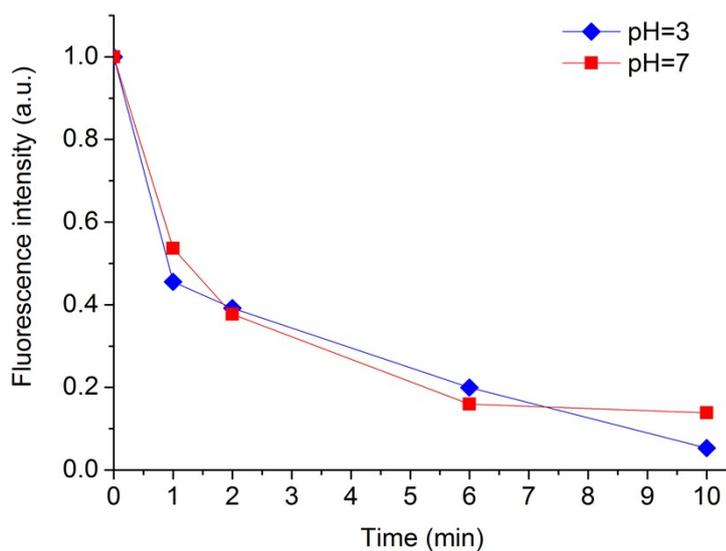
**Figure S11** Steady-state emission spectra of Pe ( $\lambda_{\text{ex}} = 410 \text{ nm}$ ) solubilized in PAH-graft-PVN after various time of irradiation in Rayonet photoreactor.



**Figure S12** Normalized fluorescence intensity ( $\lambda_{\text{ex}} = 410 \text{ nm}$ ,  $\lambda_{\text{em}} = 450 \text{ nm}$ ) for perylene solubilized in PAH-graft-PVN after various times of irradiation in Rayonet photoreactor.



**Figure S13** Steady-state emission spectra of Pe ( $\lambda_{\text{ex}} = 410 \text{ nm}$ ) encapsulated in the capsules after various times of irradiation in Rayonet photoreactor.



**Figure S14** Normalized fluorescence intensity ( $\lambda_{\text{ex}} = 410 \text{ nm}$ ,  $\lambda_{\text{em}} = 450 \text{ nm}$ ) for perylene encapsulated in the capsules after various times of irradiation in Rayonet photoreactor.