

## SUPPLEMENTARY INFORMATION

### Morphology Effect of Polythiophene Catalysts on Photo-degradation of Methylene Blue

Yue Yu<sup>a</sup>, Jiancheng Jin<sup>a</sup>, Xi Yu<sup>a</sup>, Xiangheng Xiao<sup>b</sup>, Xinlin Hong<sup>a\*</sup>

<sup>a</sup>College of Chemistry and Molecular Sciences, Wuhan University, Wuhan, P. R. China,  
Fax: +86 27 68756619; Tel: +86 27 68756619; E-mail: hongxl@whu.edu.cn

<sup>b</sup>School of Physics and Technology, Wuhan University, Wuhan, P. R. China

### Detailed methods

#### Synthesis of PTh-1, PTh-2 and PTh-3

All reagents were purchased from Sigma-Aldrich unless otherwise noted and used as received.

PTh-1: Thiophene monomer (0.03 mol) was dissolved in acetonitrile (100 mL) in a 500 mL reaction vessel. Then, ferric chloride (0.12 mol) dissolved in acetonitrile (100 mL) was added dropwise into thiophene solution. The polymerization was allowed to proceed for 24 h at 25 °C with stirring. After the reaction was completed, the mixture was filtered and washed with ethanol and distilled water for 3 times. The solid material was further collected and dried in vacuum at 60 °C for 24 h.

PTh-2: Thiophene monomer (0.03 mol) was dissolved in chloroform (100 mL) in a 500 mL reaction vessel. Then, ferric chloride (0.12 mol) dissolved in acetonitrile (100 mL) was added dropwise into the above-mentioned solution at 0 °C for 24 h. After reaction, the mixture was filtered and washed with ethanol and distilled water for 3 times. The

solid material was further collected and dried in vacuum at 60 °C for 24 h.

PTH-3: Thiophene monomer (0.0025 mol) was dissolved in ethanol (50 mL) and chloroform (50 mL) in a 500 mL reaction vessel. Then, ferric chloride (0.01 mol) was dissolved in ethanol (50 mL) and chloroform (50 mL), and was added dropwise into the obovementioned solution at 25 °C for 24 h. After reaction, the mixture was filtered and washed with ethanol and distilled water for 3 times. The solid material was further collected and dried in vacuum at 60 °C for 24 h.

### Supplementary Schemes/Figures

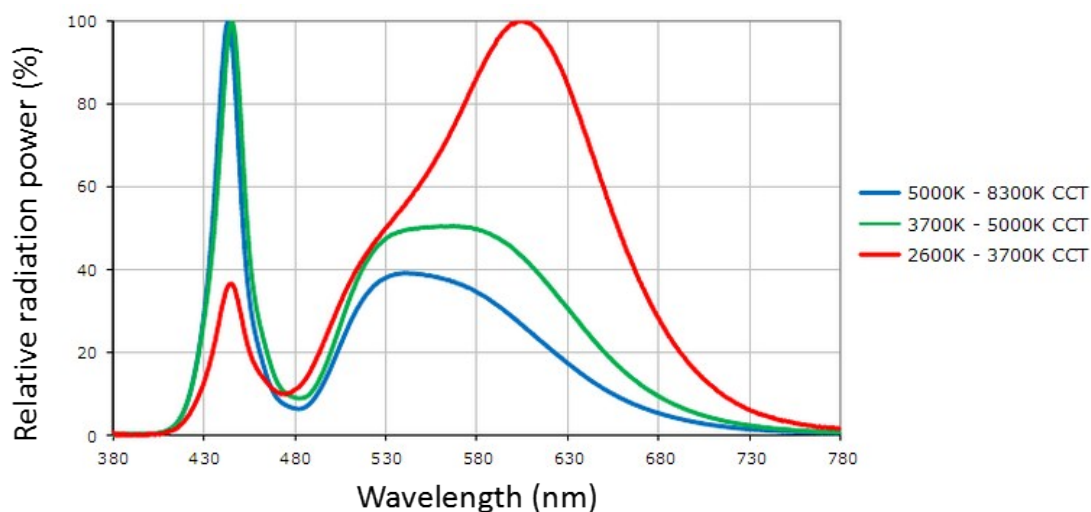


Figure S1 The relative radiation power at different wavelength of LED light, and 5000-8300K CCT is chosen in the experiment.

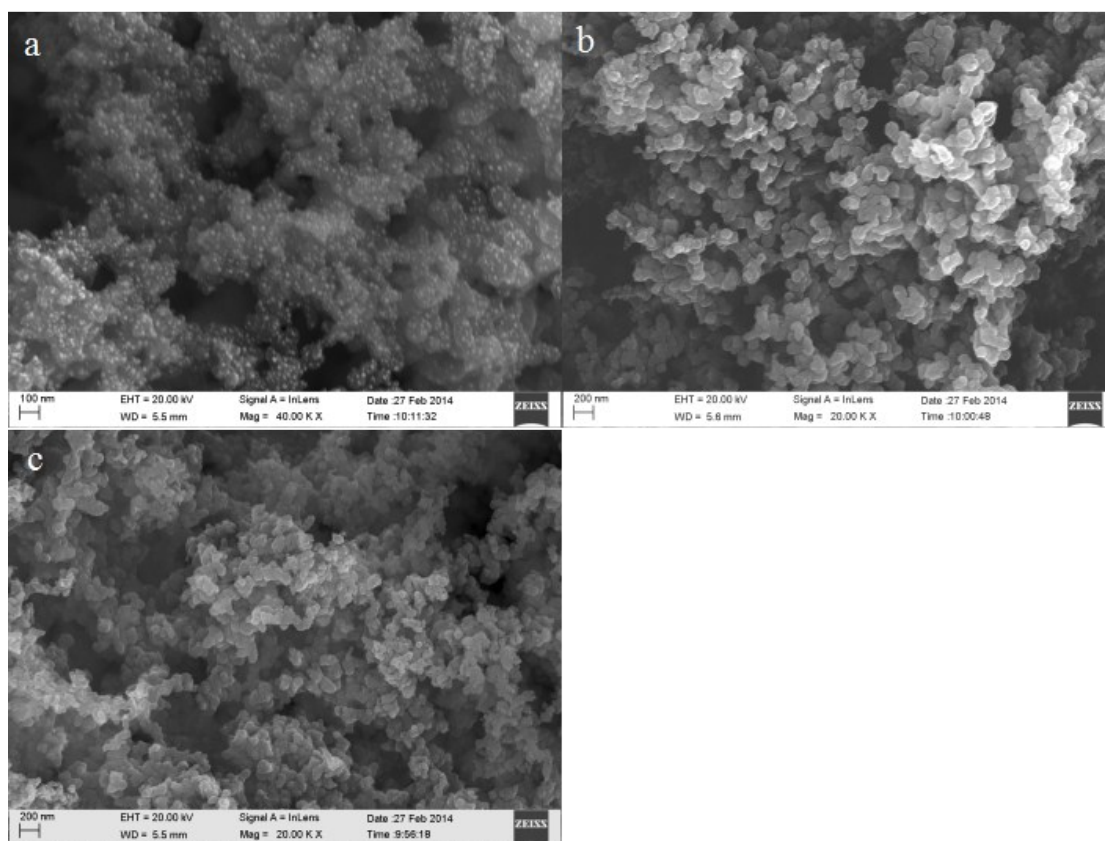


Figure S2 SEM images of PTh synthesized at 0 °C for (a) 4 h, (b) 8 h, (c) 24 h in acetonitrile.

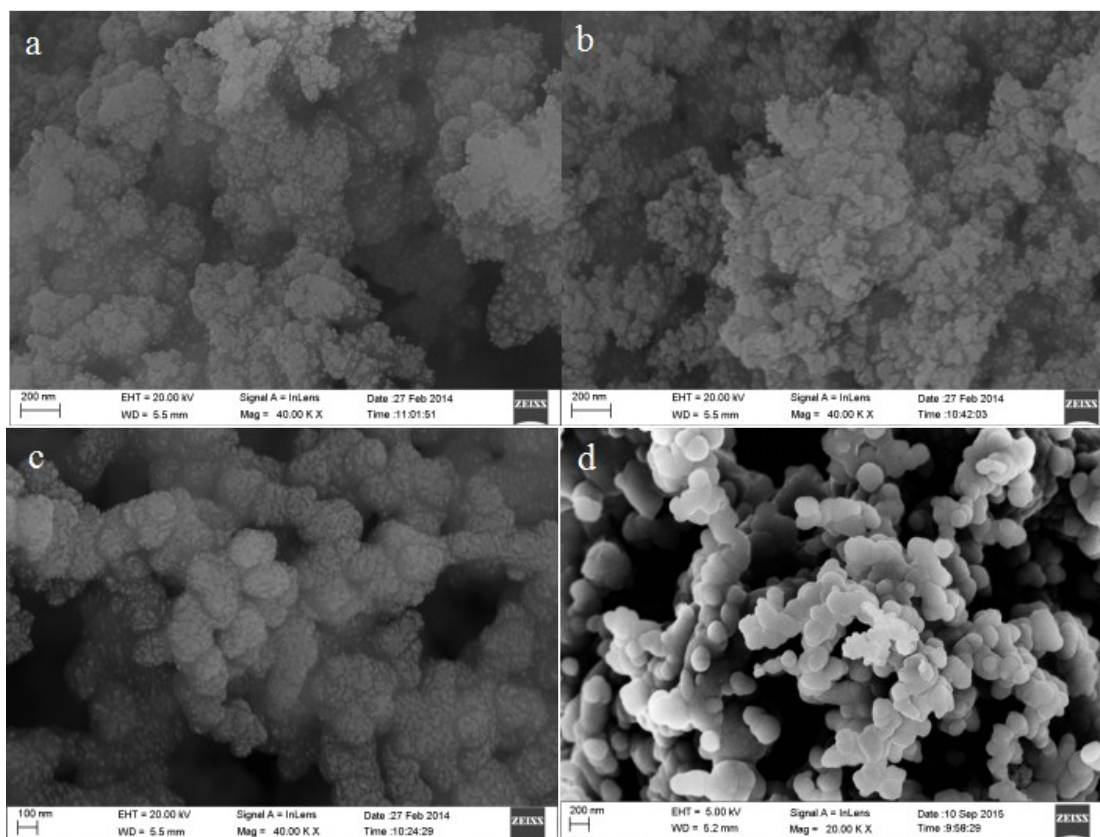


Figure S3 SEM images of PTh synthesized at 0 °C for (a) 4 h, (b) 8 h, (c) 16 h, (d) 24 h in acetonitrile and chloroform.

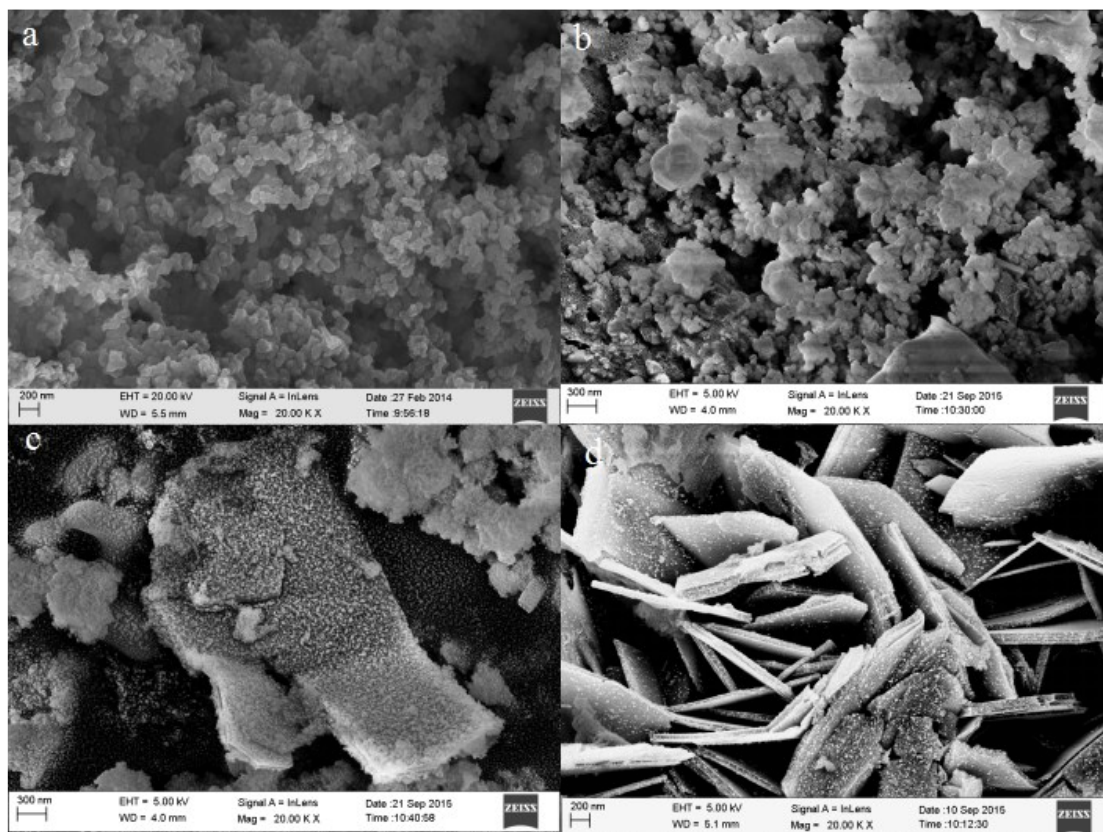


Figure S4 SEM images of PThs synthesized in acetonitrile with different concentrations of monomer and ferric chloride (a) 0.15 and 0.6 mol/L, (b) 0.0125 and 0.6 mol/L, (c) 0.15 and 0.05 mol/L, (d) 0.0125 and 0.05 mol/L at 25 °C for 24 h.

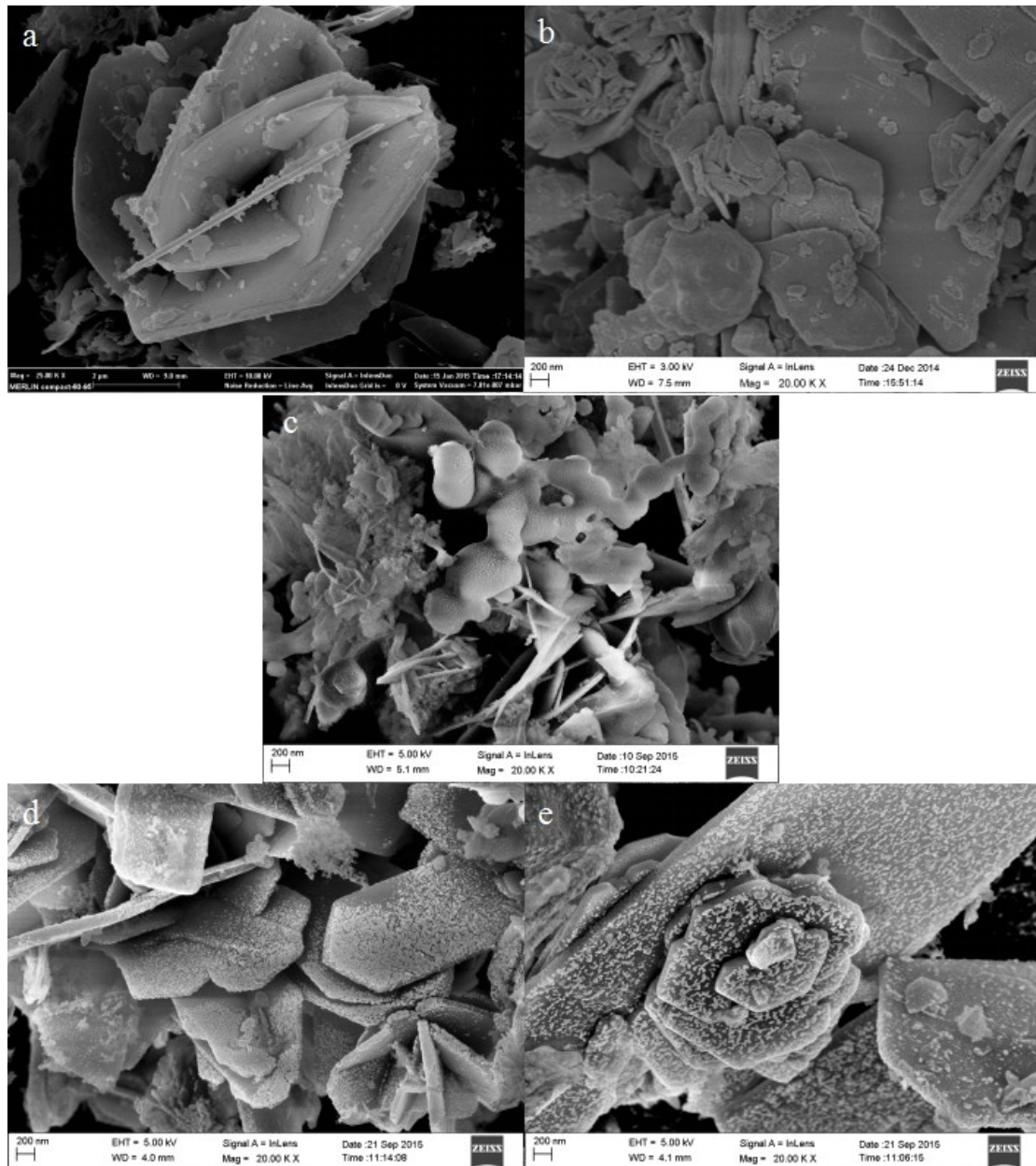


Figure S5 SEM images of PTh synthesized in chloroform and ethanol for 24 h with different concentrations of monomer and ferric chloride: (a) 0.0125 and 0.05 mol/L, (b) 0.05 and 0.2 mol/L, (c) 0.15 and 0.6 mol/L at 25 °C. SEM images of PTh synthesized at (d) 40 °C and (e) 55 °C comparing with (a).

