## Composite PS-b-P4VP/Ag and PS-b-P4VP/Au thin films fabricated

## via a multilevel self-assembly process

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**Fig. S1.** TEM micrographs of thin films formed at the air/water interface: (a)  $V_{\text{DMF}}/V_{\text{CHCl}_3} = 6/4$ , the fabrication time is 8h, the concentrations of polymer and AgNO<sub>3</sub> are 0.2 mg mL<sup>-1</sup> and 0.01 mol L<sup>-1</sup>, respectively.



Figure S2. TEM micrographs of the aggregates formed in the upper-phase (the aqueous solution), HAuCl<sub>4</sub> aqueous solution with a concentration of 0.001 mol L<sup>-1</sup> and  $V_{\text{DMF}}/V_{\text{CHCl}_3} = 6/4$ .



**Figure S3.** Catalytic reduction of 4-NA. Typical time-dependent UV-vis absorption spectra of the reaction solutions in the presence of composite thin films of PS-b-P4VP/Ag in six successive cycles (a-f).



**Figure S4.** Catalytic reduction of 4-NA. Typical time-dependent UV-vis absorption spectra of the reaction solutions in the presence of composite thin films of PS-b-P4VP/Au in six successive cycles (a-f).