# Supplementary Information

# Polymer microcapsules loaded with Ag nanocatalyst as active microreactors†

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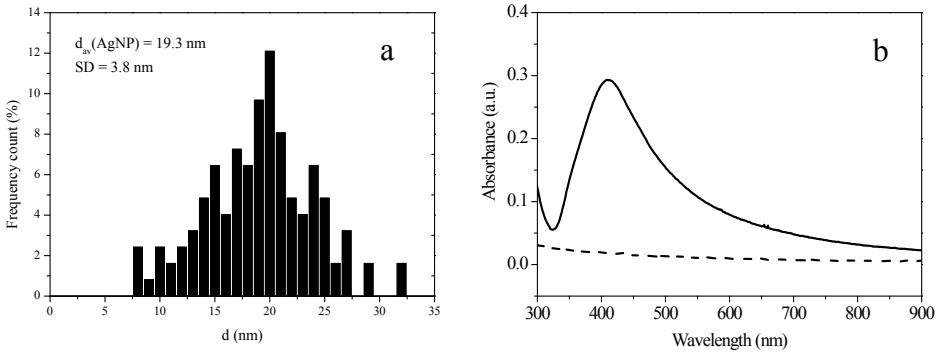


**Fig. S1** (a) Size distribution histogram of AgNP immobilized $SiO_2$ and (b) UV-Vis spectra of bare $SiO_2$ particles (dash line) and Ag/$SiO_2$ (solid line) prepared by borohydride reduction of silver acetate in the presence of $SiO_2$ particles in THF/$H_2O$ mixture (see details in manuscript).

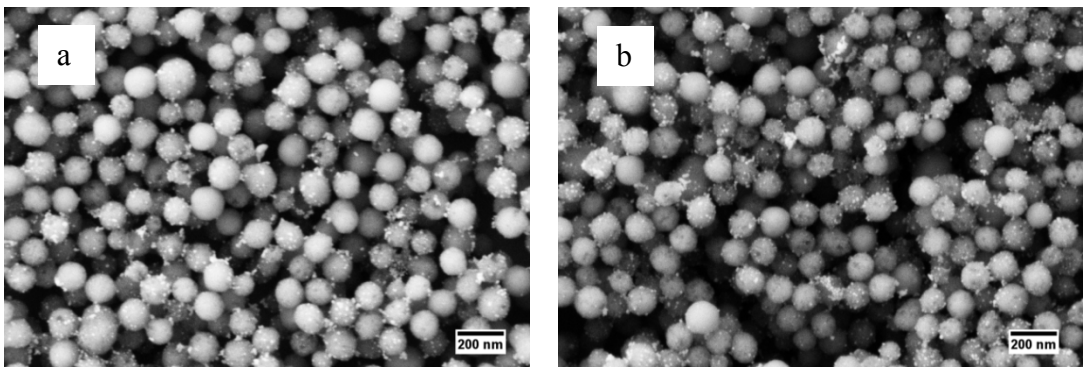


**Fig. S2** SEM images of Ag/$SiO_2$ after ultrasonication in water for (a) 15 and (b) 60 min.

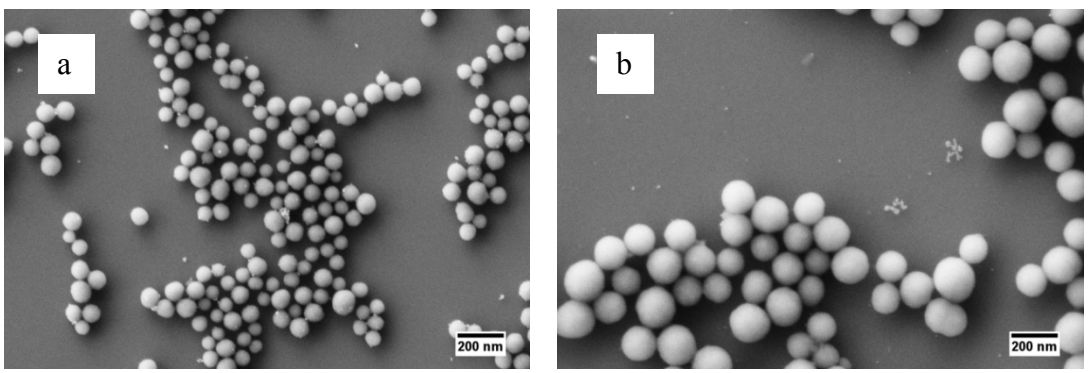


**Fig. S3** SEM images of Ag/$SiO_2$ prepared by borohydride reduction of silver acetate in (a) pure water and (b) pure THF.

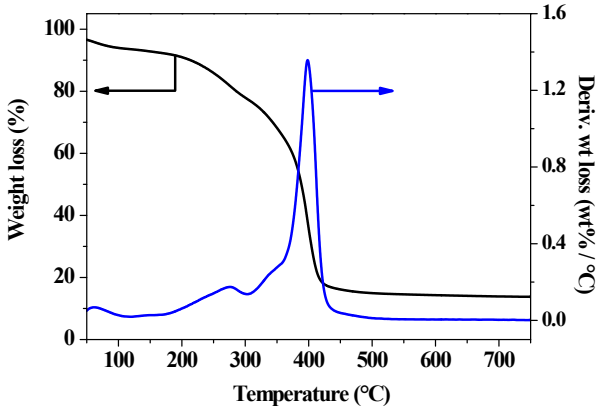


**Fig. S4** TGA (black) and DTGA (blue) curves of MC(Ag/$SiO_2$).

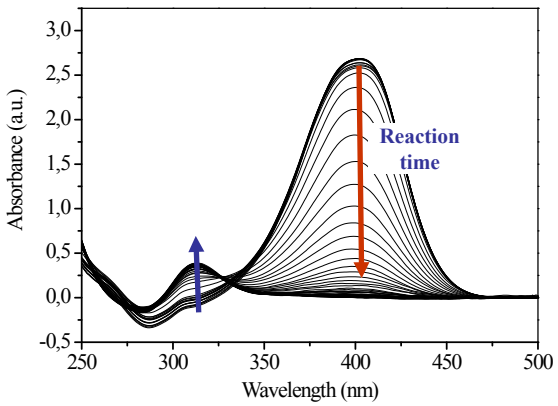


**Fig. S5** Successive UV-Vis spectra taken after every minute during borohydride reduction of 4-NP catalysed by Ag/$SiO_2$ nanocatalyst. Initial reactant concentrations: [4-NP] = 0.125 mM, [$NaBH_4$] = 1.5 M, [Ag] = 0.54 $10^{-3}$ mg/ml.

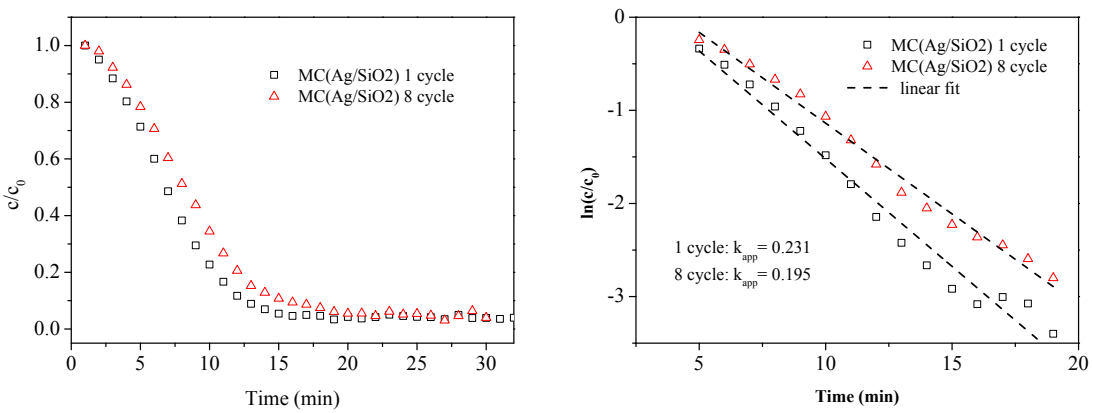


**Fig. S6** Plots of $c/c_0$ (a) and $\ln(c/c_0)$ (b) versus time for the borohydride reduction of 4-NP catalysed by MC(Ag/$SiO_2$) (data obtained for 1st and 8th successive cycles using the same portion of catalyst. [Ag] = 0.52 $10^{-3}$ mg/ml.

MC(Ag/$SiO_2$) were used for several subsequent cycles of catalytic reduction of 4-nitrophenol. Reaction was carried out in centrifugation tube and conversion of 4-NP was assumed to be complete after full de-colorization of reaction mixture. After each cycle the catalyst was separated by centrifugation, supernatant was removed and new portion of 4-nitrophenol and $NaBH_4$ mixture was

added to the catalyst. First and last cycles were carried out in cuvette and monitored by UV-vis to analyse degree of 4-NP conversion and determine reaction rate constant. Figure S5 shows (a) depletion of 4-nitrophenol relative concentration ($c/c_0$) versus time and (b) $\ln(c/c_0)$ versus time obtained for the $1^{st}$ and $8^{th}$ cycles of catalytic reaction carried out with the same portion of catalyst ($[Ag]_0=0.52\ 10^{-3}$ mg/ml). Constants differ from each other for ~10% which might be due to incomplete transfer of catalyst from centrifugation tube into cuvette. Notably, our attempts to monitor reaction by UV-Vis during every successive cycle were failed after $4^{th}$ cycle, probably due to catalyst loses during its transferring from centrifugation tube into cuvette.