

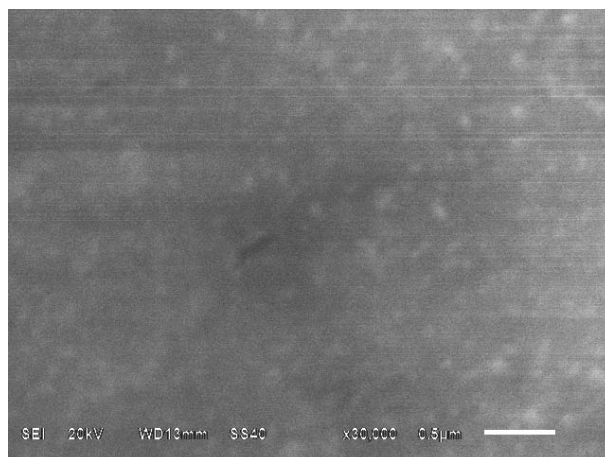
**Environmentally friendly light-driven synthesis of Ag nanoparticles *in situ* grown on magnetically separable biohydrogels as highly active and recyclable catalysts for 4-nitrophenol reduction**

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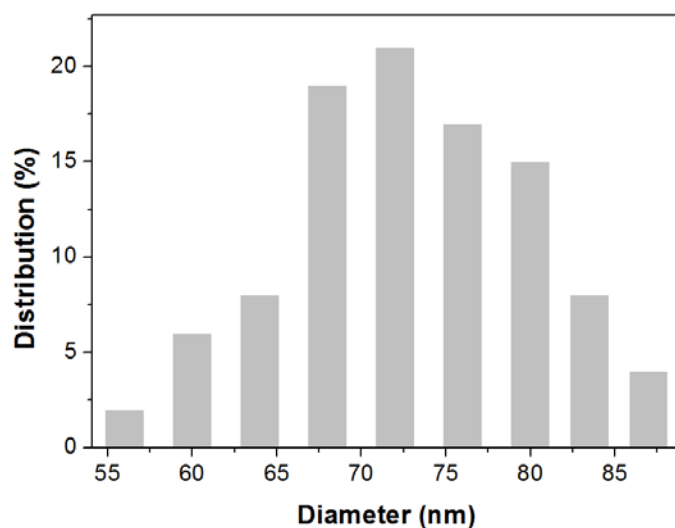
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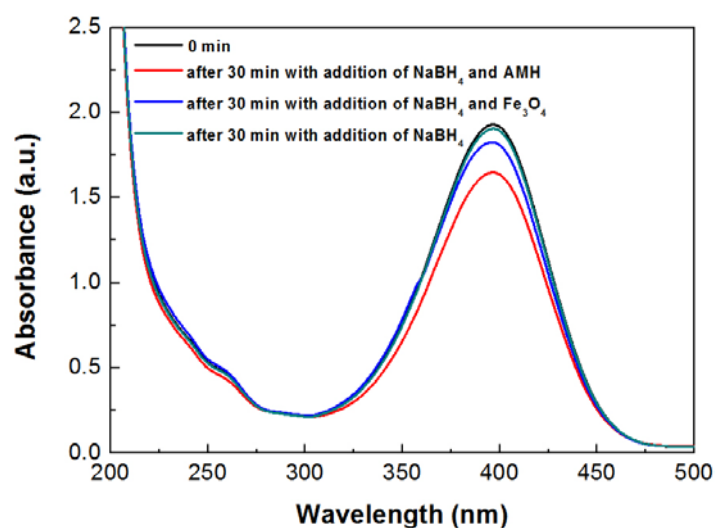
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**Fig. S1** SEM image of dried Ag@alginate beads. Scale bar in figure is 500 nm.



**Fig. S2** The particle size distribution of Ag NPs in Ag@AMH.



**Fig. S3** UV-vis spectra of 4-NP in the presence of the AMH and NaBH<sub>4</sub> (red line), the Fe<sub>3</sub>O<sub>4</sub> and NaBH<sub>4</sub> (blue line), and NaBH<sub>4</sub> (dark cyan line) for 0 and 30 min.

As shown in Fig. S3, in the absence of the catalyst, the solution is very stable, and the absorption intensity remains unchanged after 30 min. We have also carried out control experiments to compare catalytic activity of Ag@AMH with that of AMH and Fe<sub>3</sub>O<sub>4</sub> particles. A slight decrease in intensity of the characteristic peak of 4-nitrophenolate ion (400 nm) but no new peak at 300 nm (the characteristic peak of 4-AP) were observed after reaction

of 30 min, indicating that this reaction process should be the adsorption of 4-nitrophenolate  
but not due to reduction.