

Supplementary Information

Alginate fibers embedded with silver nanoparticles as efficient catalysts for reduction of 4-nitrophenol

Xihui Zhao ^{a,c,*}, Qun Li ^{a,c}, Xiaomei Ma ^{a,c}, Zhong Xiong ^{a,c}, Fengyu Quan ^{a,c}, Yanzhi Xia ^{b,c,*}

^a College of chemistry and chemical engineering, Qingdao University, Qingdao 266071, China

^b State Key Laboratory Cultivating Base for New Fiber Materials and Modern Textiles, Qingdao University, Qingdao 266071, China

^c Collaborative Innovation Center for Marine Biomass Fibers, Materials and Textiles of Shandong Province, Qingdao University, Qingdao 266071, China

* Corresponding author: Tel.: +86 532 85950962; Fax: +86 532 85952497

E-mail address: gaozxh@163.com (X. Zhao), xiayzh@qdu.edu.cn (Y. Xia)

List of contents:

Table S1 EDS quantitative elemental analysis of alginate-AgNPs fibers synthesized at 80 °C, 12mM AgNO₃.

Fig. S1. XPS spectra for alginate-AgNPs fibers synthesized at 60°C (a) survey spectrum; (b) the deconvolution of Ag 3d region.

Fig. S2. Time-dependent absorption spectra of the reaction solution of 4-NP to 4-AP over varied formed alginate-AgNPs fibers catalyst.(a),(b),(c) are alginate-AgNPs fibers formed at 80 °C for 45 min with silver nitrate concentration of 8 mM, 16 mM and 24 mM respectively. (d),(e),(f) are alginate-AgNPs fibers synthesized at 60 °C,70 °C and 80 °C for 45 min with silver nitrate concentration of 12 mM, respectively.

Fig. S3. Plot of $\ln(A_t/A_0)$ against the reaction time. (a) alginate-AgNPs fibers formed at 80 °C for 45 min with silver nitrate concentration of 8 mM (1), 16 mM (2) and 24 mM (3). (b) alginate-AgNPs fibers synthesized at 60 °C (1), 70 °C (2) and 80 °C (3) for 45 min with silver nitrate concentration of 12 mM, respectively.

Fig. S4. TEM images of the recycled fiber sample in cross sections.

Table S1 EDS quantitative elemental analysis of alginate-AgNPs fibers synthesized at 80 °C, 12mM AgNO₃.

Element	Weight %	Atomic %
C K	38.07	51.86
O K	39.04	39.92
Ca K	18.54	7.57
Ag L	4.35	0.66
Totals	100.00	

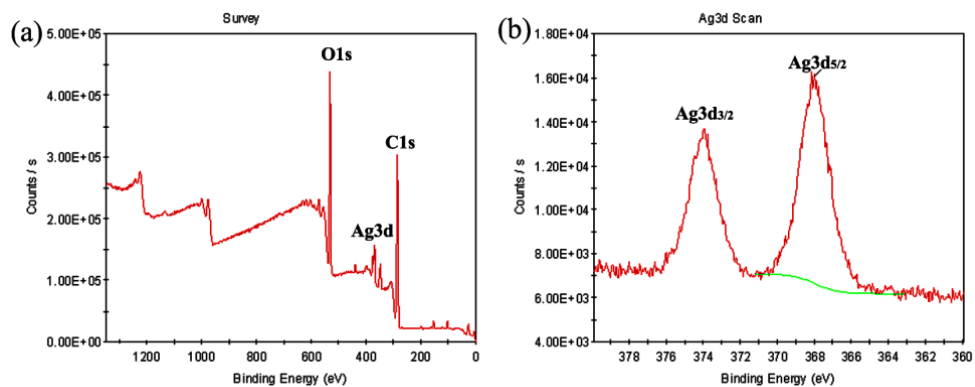


Fig. S1.

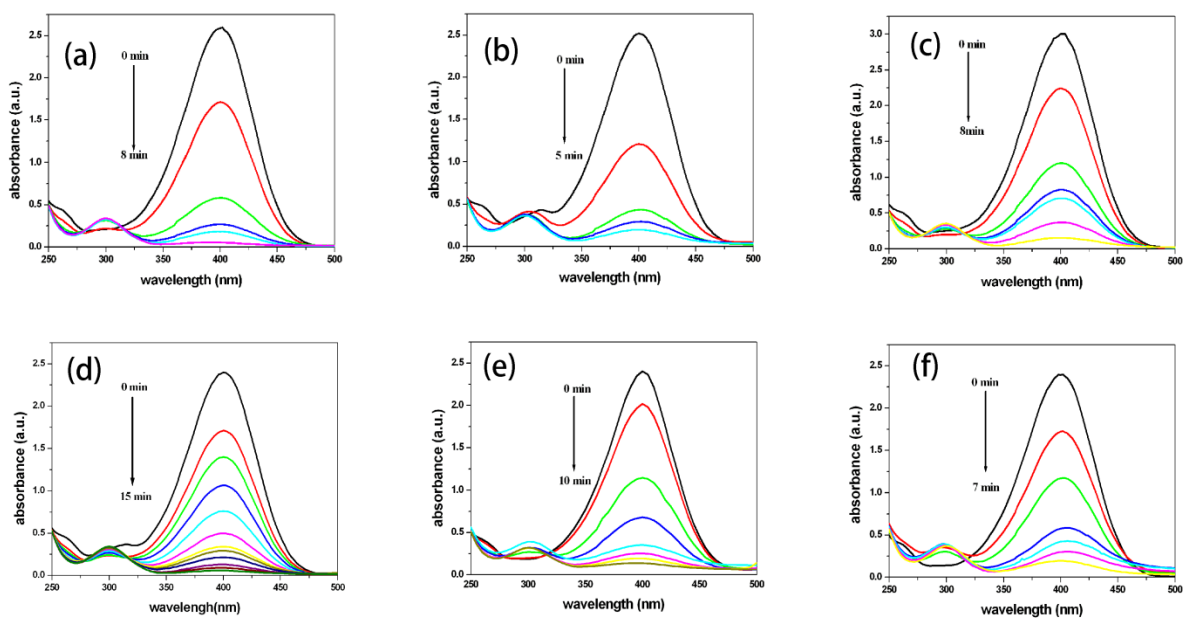


Fig. S2.

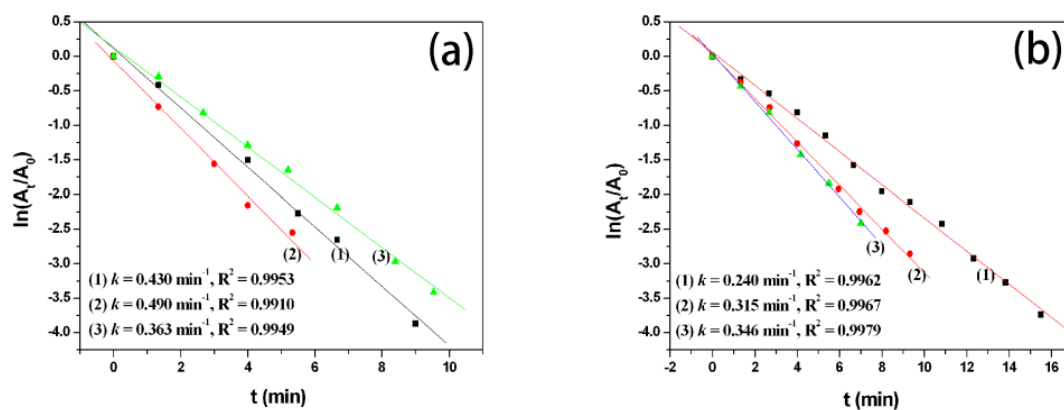


Fig. S3.

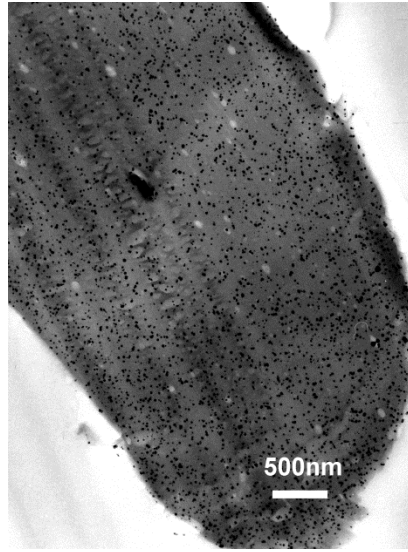


Fig. S4.