Anchoring gold nanoparticles inside polyaniline shell with magnetic cores for enhancing catalytic stability

Xiaoguang Qiao, Xianchun Liu, Xiaoting Li and Shuangxi Xing*

Faculty of Chemistry, Northeast Normal University, 5268 Renmin Street, Changchun, P.R. China 130024
Tel: (+86) 85099657; E-mail: xingsx737@nenu.edu.cn

Preparation of Au nanoparticles

The AuNPs ($d_{av} = 15 \pm 1$ nm) were synthesized by a classical approach reported previously (Nat. Phys. Sci. 1973, 241, 20). A mixture of 95 mL of deionized water and 5 mL of HAuCl$_4$ (2 mg mL$^{-1}$) were preheated for 10 min at 110 $^\circ$C. After that, 3 mL of sodium citrate tribasis dehydrate was added quickly and the reaction was stirring for 30min continuously.

Preparation of Fe$_3$O$_4$ particles

The water-dispersible Fe$_3$O$_4$ particles were prepared following literature procedures (Angew. Chem. Int. Ed., 2009, 48, 5875). FeCl$_3$·6H$_2$O (1.08 g), sodium acetate (1.05 g) and sodium citrate tribasis dehydrate (0.249 g) were dissolved in 20 mL of ethylene glycol in a round-bottom flask by sonication following by vigorous stirring for 40 min. Then the mixture was transferred to a Teflon-lined stainless steel autoclave and heated at 200 $^\circ$C. After 10 h, the autoclave was cooled to room temperature. The obtained black precipitate were washed several times with ethanol and water and dried under vacuum at 50 $^\circ$C for one night.

Figure S1. UV-Vis absorption spectra of the reduction of 4-NP by NaBH$_4$ using Fe$_3$O$_4$@SiO$_2$@Au particles as catalyst at different time.
Figure S2. UV-Vis absorption spectra of the reduction of 4-NP by NaBH₄ using Fe₃O₄@Au-PANI-II particles as catalyst at different time.