

## Supporting Information

### Yolk-shell Fe<sup>0</sup>@SiO<sub>2</sub> Nanoparticles as Nanoreactors for Fenton-like Catalytic Reaction

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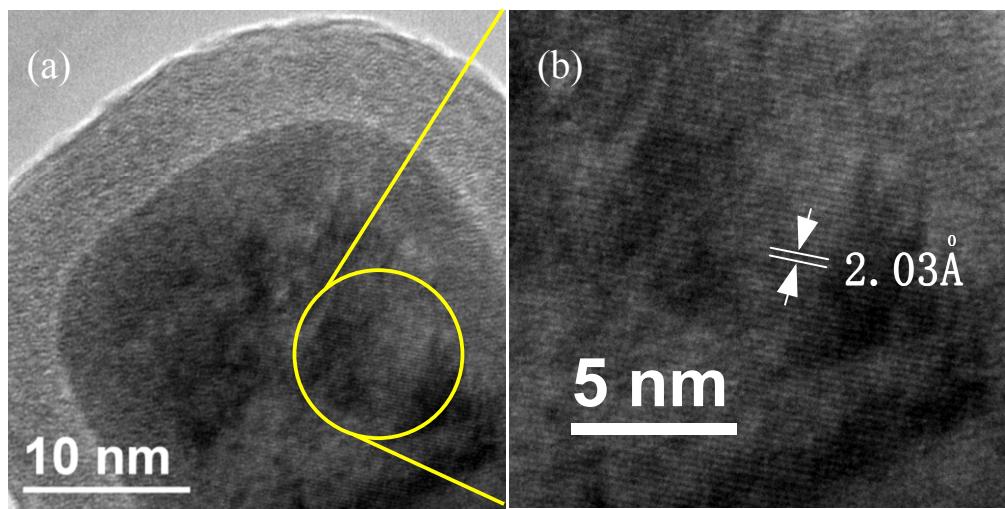


Figure S1. HRTEM image of bare  $\text{Fe}^0$ : (b) is magnification image of the area marked by the circle in (a)

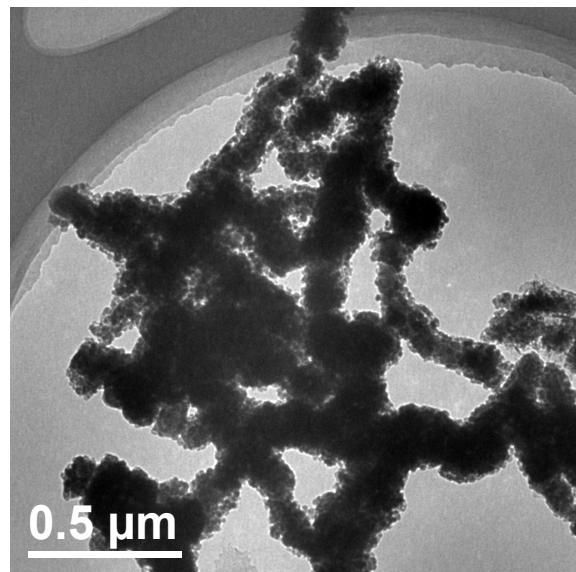


Figure S2. TEM image of bare  $\text{Fe}^0$

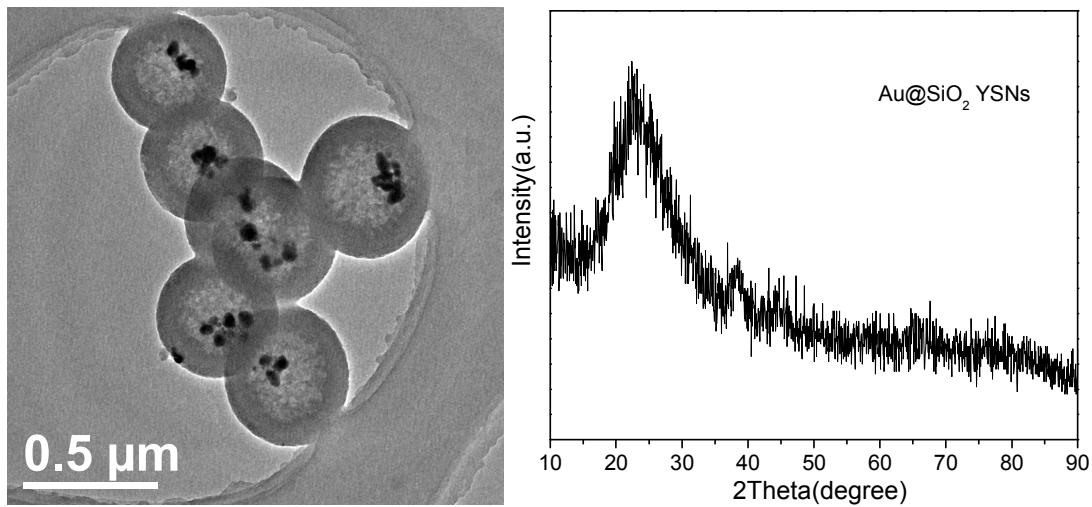


Figure S3. TEM image and wide-angle XRD of Au@SiO<sub>2</sub> YSNs.

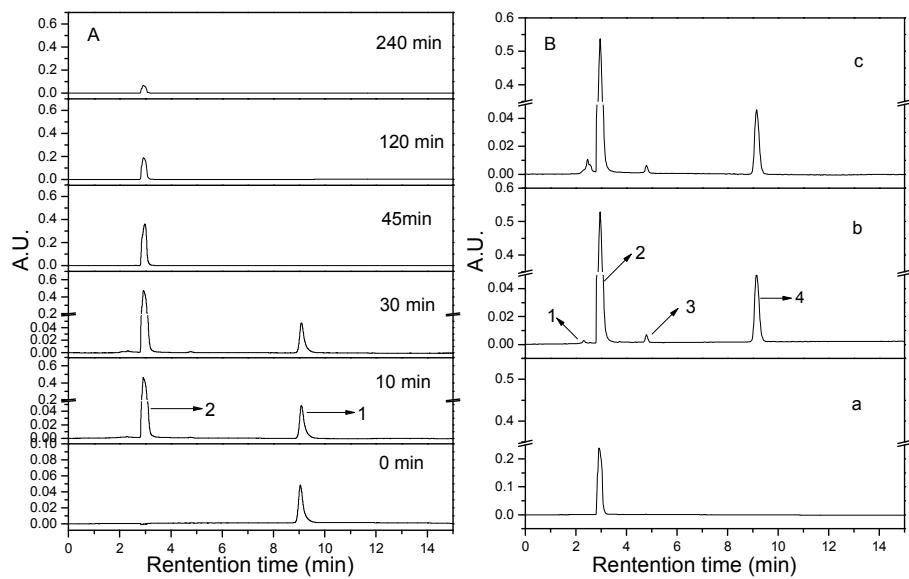


Figure S4. (A) HPLC of samples from  $\text{Fe}^0@\text{SiO}_2\text{-TS}$  at pre-determined reaction time: 1-phenol, 2- maleic acid; (B) HPLC of samples at 1h: (a)  $\text{Fe}^0@\text{SiO}_2\text{-TS}$ , (b)  $\text{Fe}^0@\text{SiO}_2\text{-DI}$ , (c) bare  $\text{Fe}^0$ ; 1, 2, 3-intermediate products, 4-phenol.

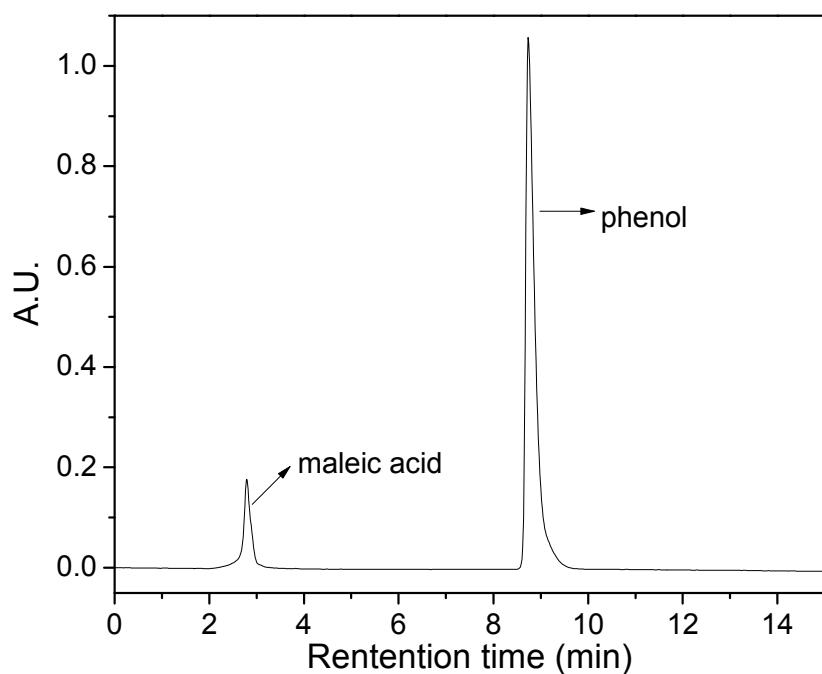


Figure S5. HPLC of standard materials