

Supporting Information

Controllable Preparation and Catalytic Performance of Magnetic $\text{Fe}_3\text{O}_4@\text{CeO}_2$ -Polysulfone Nano-composites with Core-shell Structure

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1. Characterization of the Fe₃O₄ cores and pure CeO₂ particles

Fe₃O₄ particles synthesized by solvothermal method have relatively uniform size and shape (Figure S1a-c), which benefited the subsequent wrapping steps. By surveying more than 100 nanoparticles on the SEM image through Digital Micrograph Software, it shows that the average diameter of the cores is 190nm. From the XRD pattern (Figure S1d), the characteristic peaks of the core particles corresponding to (220), (311), (400), (511), (440) are located at $2\theta = 30.095, 35.422, 43.052, 56.942, 62.515^\circ$ respectively, which fits in the cubic Fe₃O₄ crystal(Fd-3m(227)) in PDF database. The XRD peaks of Fe₃O₄ were not so obvious because the surface of Fe₃O₄ particles was modified by citrate. Besides, the characteristic peaks of pure CeO₂ synthesized by hydrothermal method under the same synthesis conditions with Fe₃O₄@CeO₂ corresponding to (111), (200), (220), (311), (222), (400), (331) are located at $2\theta = 28.554, 33.081, 47.478, 56.334, 59.085, 69.4, 76.698^\circ$, respectively. These sharp peaks demonstrate the relatively complete cubic fluorite structure of the pure CeO₂ samples.

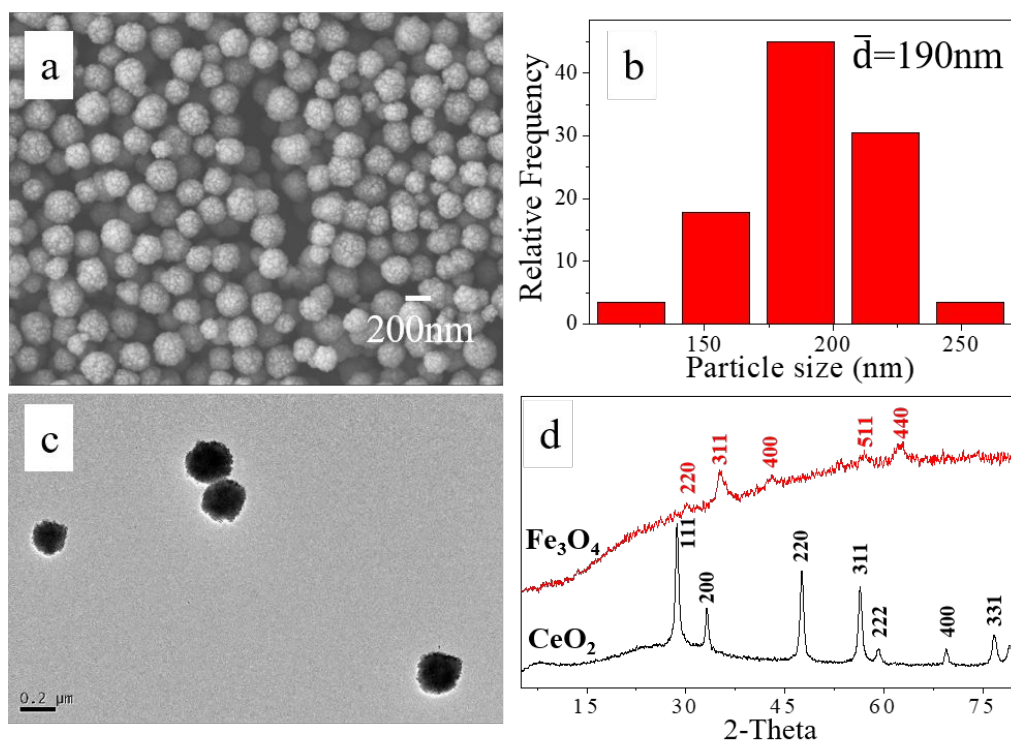


Figure S1. SEM image(a), particle size distribution(b) and TEM image(c) of Fe₃O₄ cores, XRD pattern(d) of pure CeO₂ and Fe₃O₄ cores.

2. Characterization of the $\text{Fe}_3\text{O}_4@\text{CeO}_2$ -PSF composite synthesized by different methods

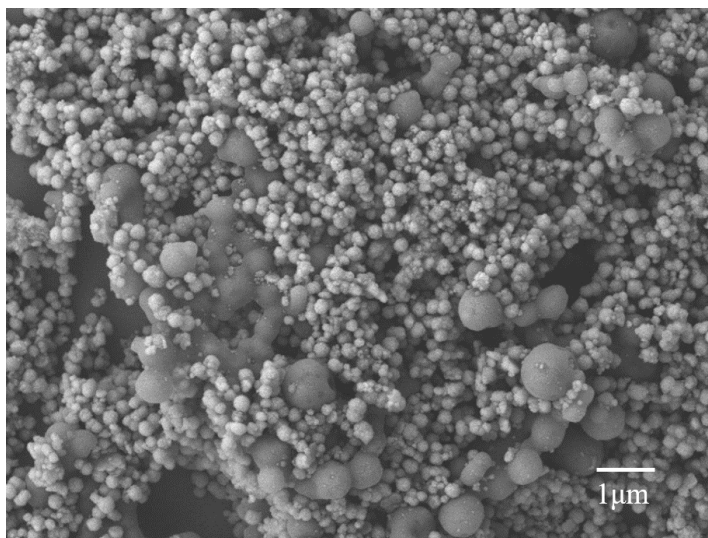


Figure S2. SEM images of $\text{Fe}_3\text{O}_4@\text{CeO}_2$ -PSF particles synthesized by two-step phase-inversion method

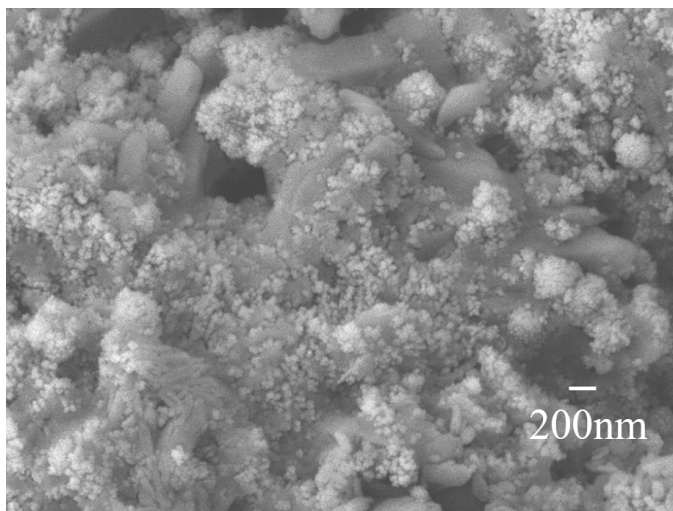


Figure S3. SEM images of $\text{Fe}_3\text{O}_4@\text{CeO}_2$ -PSF particles synthesized by mixing two emulsion systems with SDS as emulsifier