Electronic Supplementary Material (ESI) for Nanoscale.

Preparation of raspberry-like γ-Fe_2O_3/crackled nitrogen-doped carbon capsules and their application as supports to improve catalytic activity

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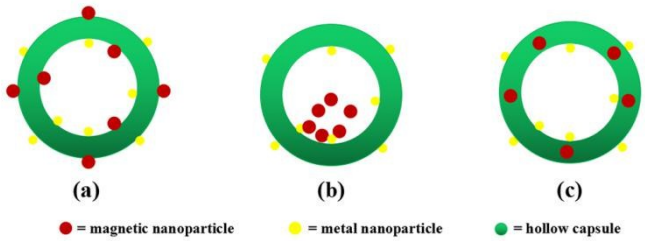

Fig. S1 Positions for magnetic nanoparticles in the hollow capsules: (a) anchoring on the inner and outer surface of capsule shell; (b) loading in the hollow voids; (c) embedding in the capsule shell.

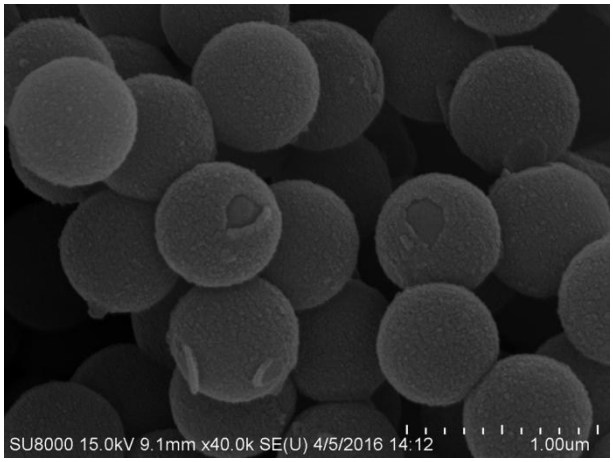

Fig. S2 SEM image of broken PS/PB/PPy composites.

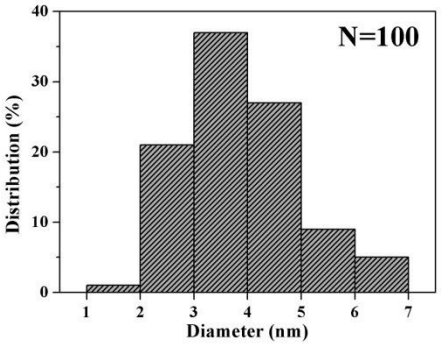

Fig. S3 Histogram of size distribution of Pd nanoparticles in γ-Fe_2O_3/CNC@Pd catalysts.

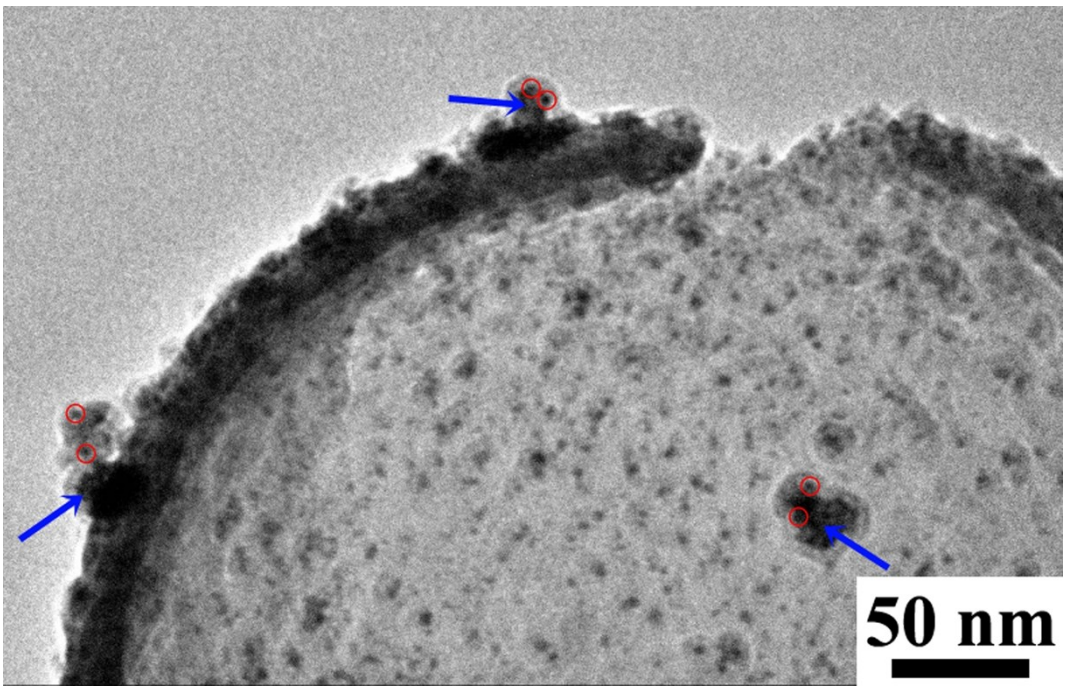

Fig. S4 Magnified TEM image of γ-Fe_2O_3/CNC@Pd catalysts. The red circles indicated Pd nanoparticles and the blue arrows indicated γ-Fe_2O_3 nanoparticles.

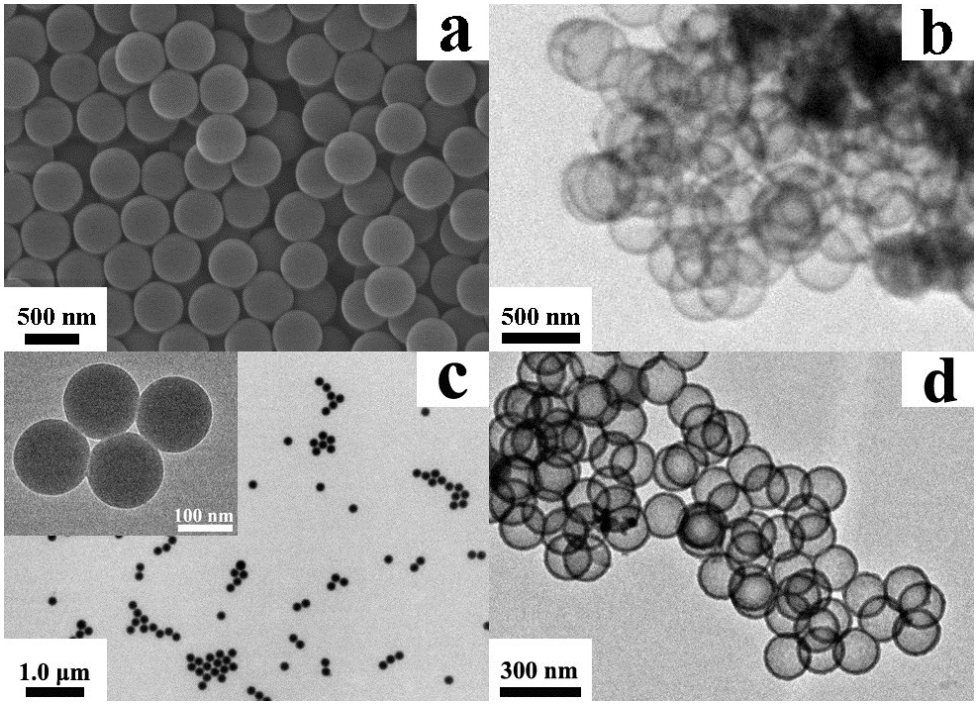

Fig. S5 (a) SEM image of PS nanoparticles with size of 470 nm; (b) TEM image of γ-Fe_2O_3/CNC capsules by using 470 nm PS as hard-templates; (c) TEM image of PS nanoparticles with size of 150 nm, inset shows the corresponding magnified image; (d) TEM image of γ-Fe_2O_3/CNC capsules by using 150 nm PS as hard-templates.

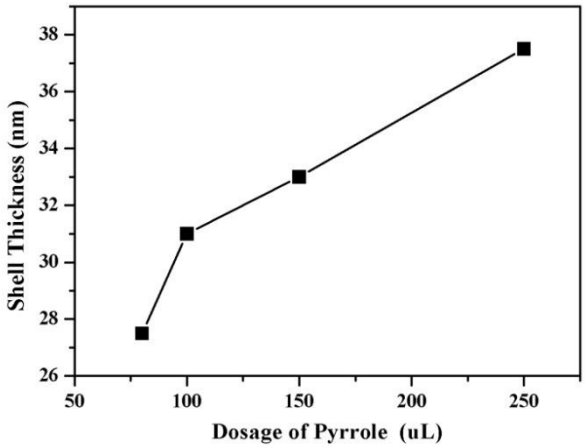

Fig. S6 The relationship between the capsule shell thickness and dosage of pyrrole monomer. Herein, the 470 nm PS nanoparticles were selected as the hard-templates to construct γ-Fe_2O_3/CNC capsules.

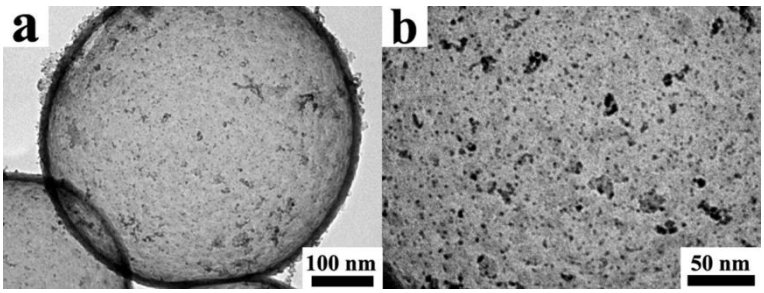

Fig. S7 TEM images of (a) γ-Fe_2O_3/CNC@Pd catalysts with 10.4 wt% Pd loading; (b) the corresponding magnified image.

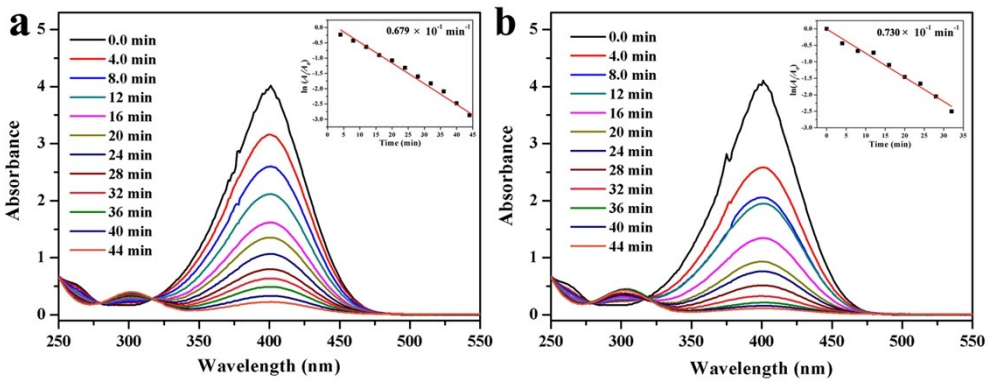

Fig. S8 Time-dependent UV-vis spectra of catalytic reduction of 4-NP by using γ-Fe_2O_3/CNC@Pd catalysts prepared by different size of PS nanoparticles: (a) 150 nm; (b) 470 nm. Insets show that the dependence of $\ln(A_t/A_0)$ on reaction time t for the reactions.

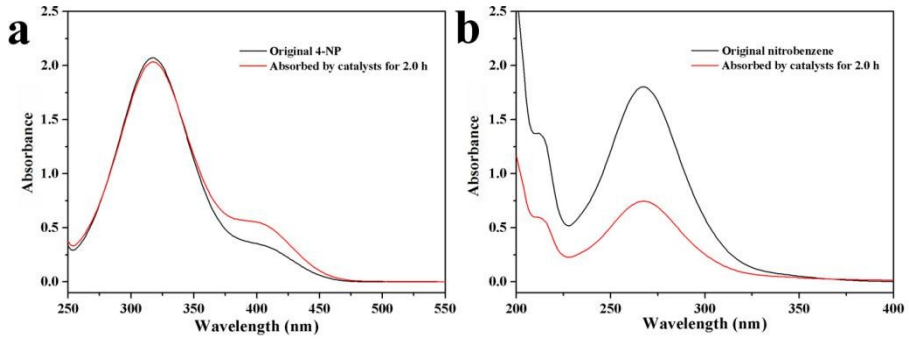

Fig. S9 Adsorption of γ-Fe_2O_3/CNC@Pd catalysts towards (a) 4-NP solution and (b) nitrobenzene solution for 2.0 h. The experimental condition: 0.1 mg catalysts were added into 6.0 mL 4-NP solution or nitrobenzene solution with the same concentration of 33 mg/L.

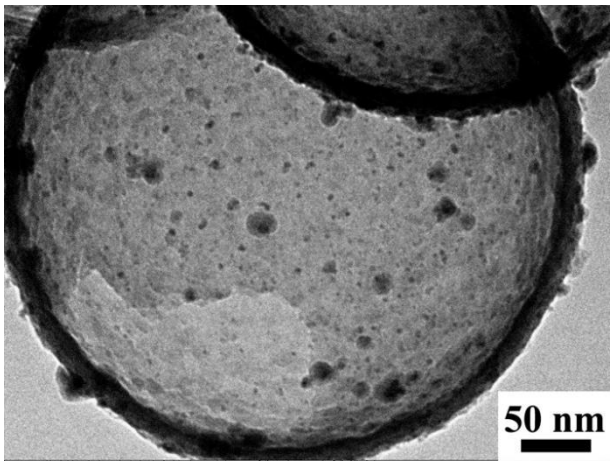

Fig. S10 TEM image of γ-Fe_2O_3/CNC@Pd catalysts after being used in catalytic tests for 4 times.