

## Supporting Information

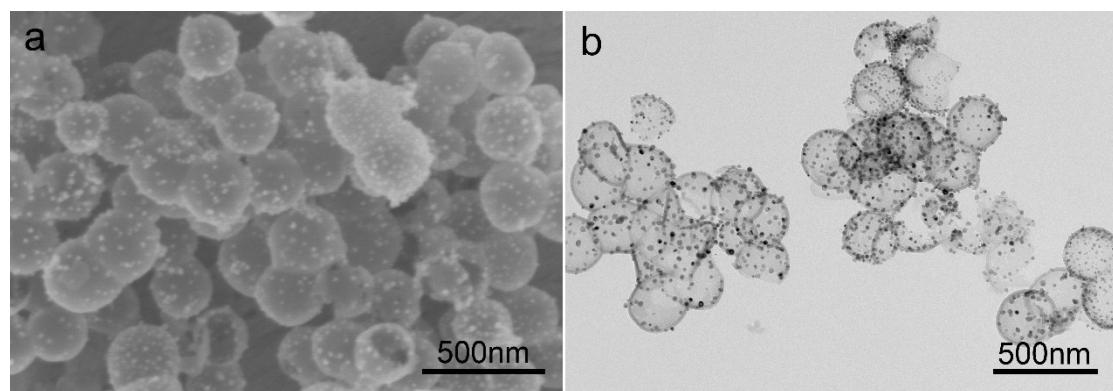
### Templated Synthesis of Nickel Nanoparticles embedded in Carbon Layer within Silica Capsules

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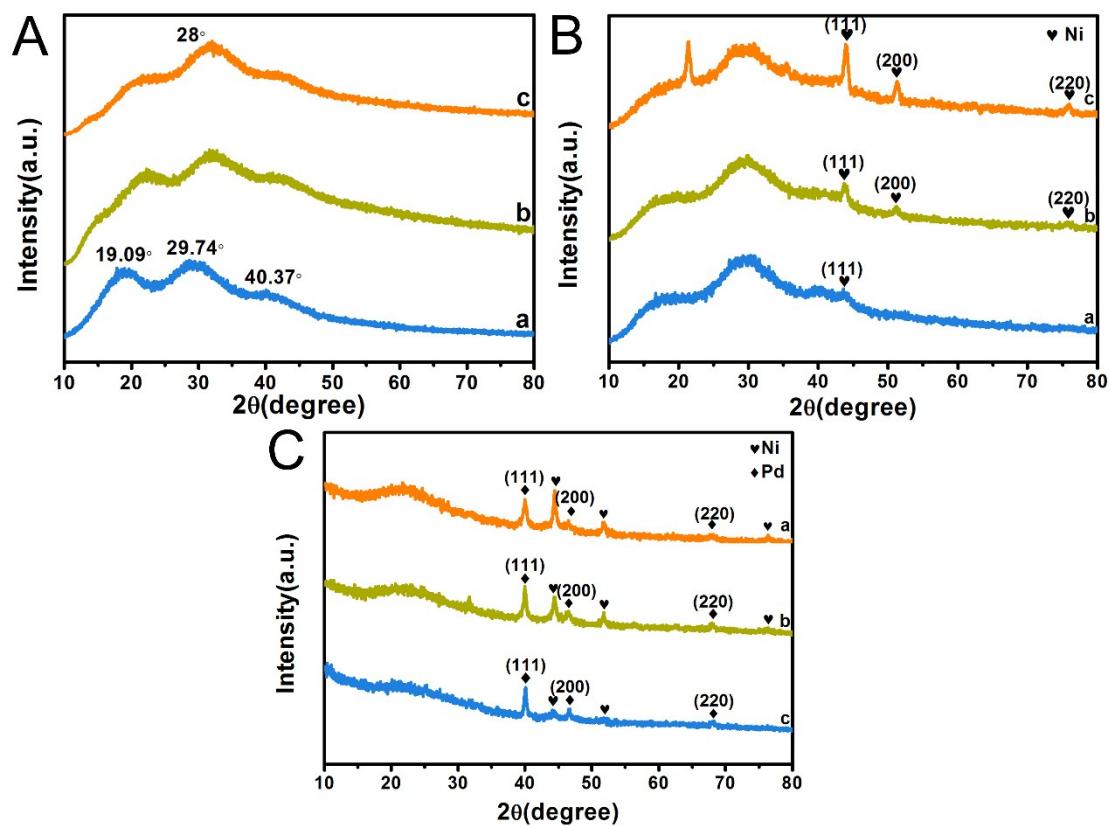
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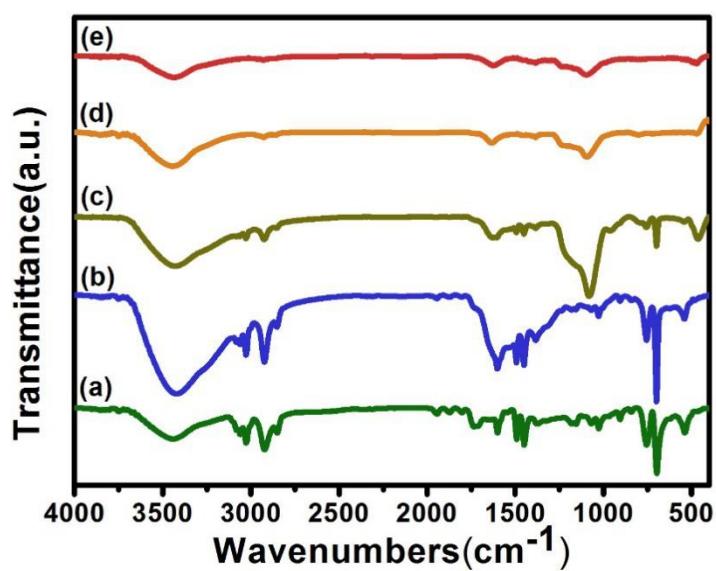
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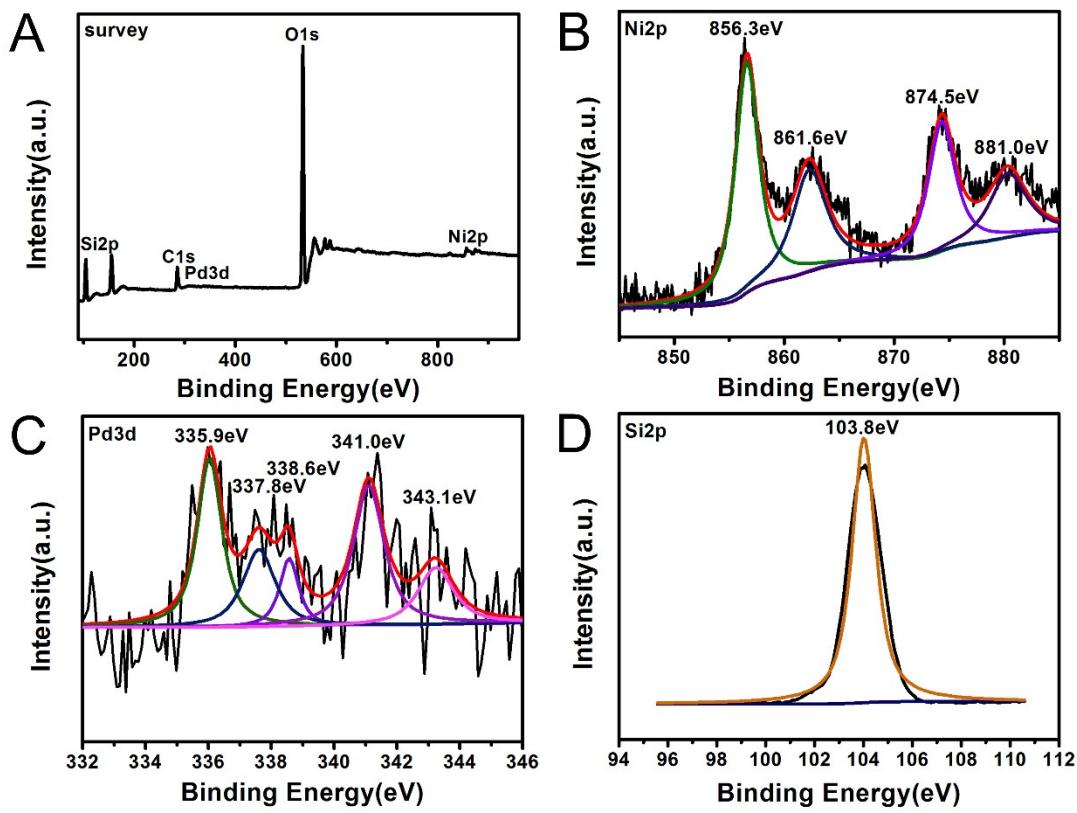
**Fig. S1** SEM and TEM images of Ni/C-500°C (a, b)



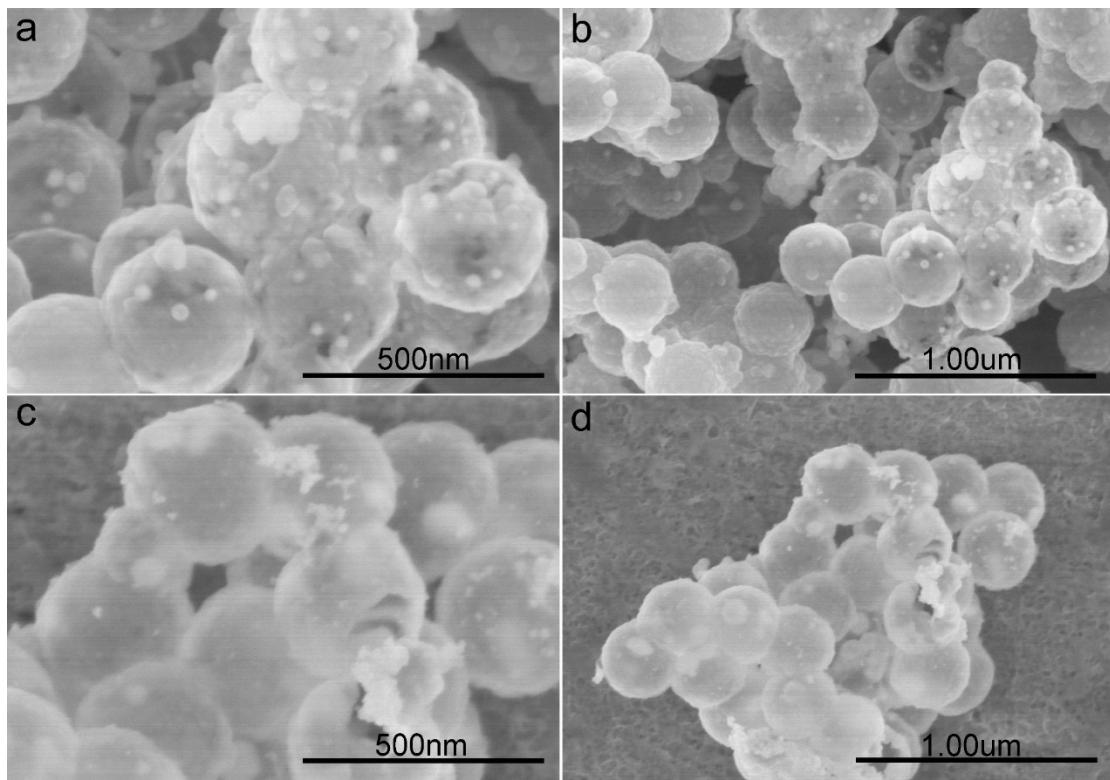
**Fig. S2** (A) X-Ray diffraction patterns of CPS (a), CPS@RF-Ni<sup>2+</sup> (b), CPS@RF-Ni<sup>2+</sup>@SiO<sub>2</sub> (c). (B) X-Ray diffraction patterns of Ni/C@SiO<sub>2</sub>-500°C (a), Ni/C@SiO<sub>2</sub>-700°C (b), Ni/C@SiO<sub>2</sub>-900°C (c). (C) X-Ray diffraction patterns of NiPd/C@SiO<sub>2</sub>-1 (a), NiPd/C@SiO<sub>2</sub>-3 (b), NiPd/C@SiO<sub>2</sub>-6 (c).



**Fig. S3** FT-IR spectra of CPS (a); CPS@RF-Ni<sup>2+</sup> (b); CPS@RF-Ni<sup>2+</sup>@SiO<sub>2</sub> (c); Ni/C@SiO<sub>2</sub>-700°C (d); NiPd/C@SiO<sub>2</sub>(e).

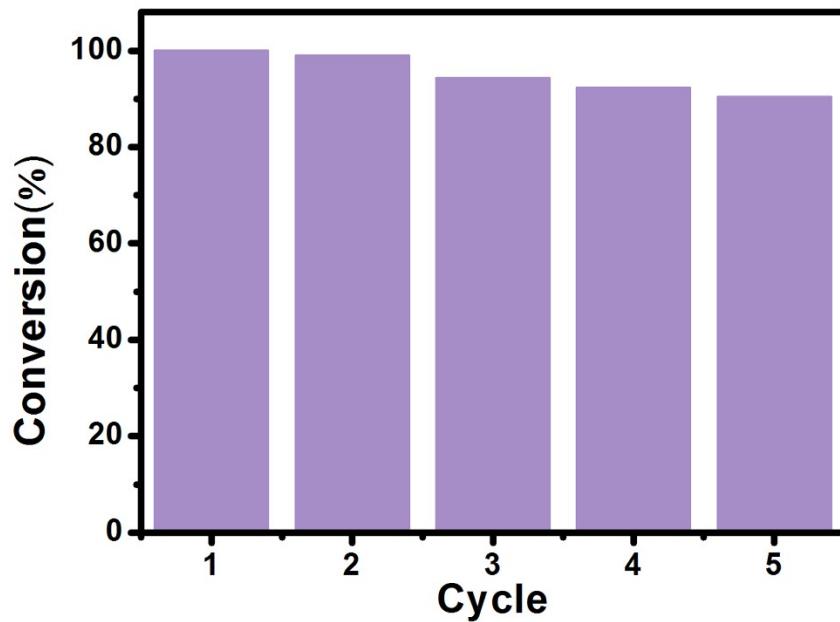


**Fig. S4** (A) XPS spectrum of NiPd/C@SiO<sub>2</sub> and high-resolution XPS of (B) Ni, (C) Pd, (D) Si elements.

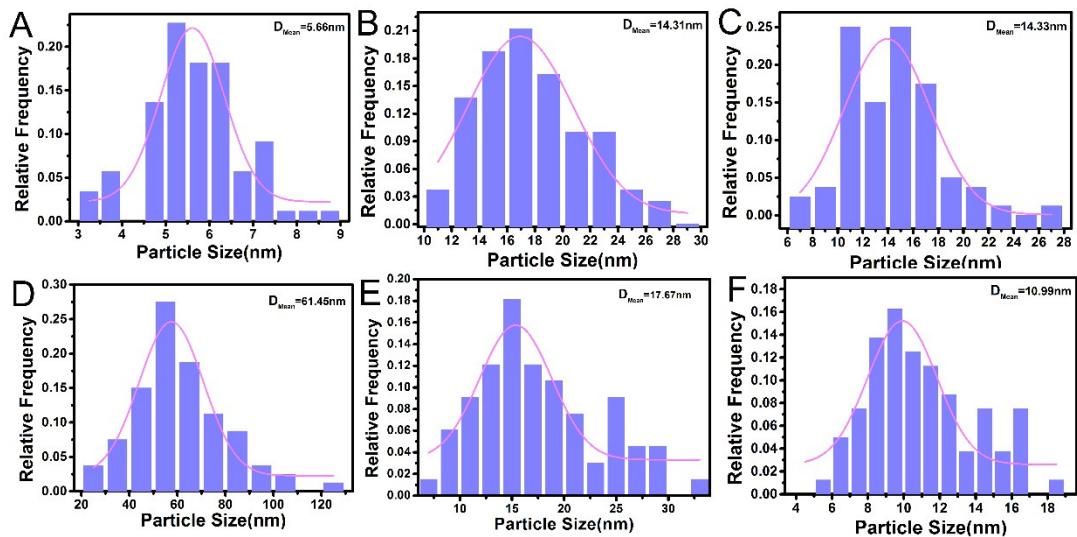


**Fig. S5** SEM images of Ni/C@SiO<sub>2</sub>-700°C after five catalytic reaction (a, b) and NiPd/C@SiO<sub>2</sub>-6 after

five catalytic reaction (c, d).



**Fig. S6** The recyclability of the NiPd/C@SiO<sub>2</sub>-6 as the catalyst for p-nitrophenol.



**Fig. S7** Size distributions of Ni/C@SiO<sub>2</sub>-500°C (A), Ni/C@SiO<sub>2</sub>-700°C (B), Ni/C@SiO<sub>2</sub>-900°C (C) and NiPd/C@SiO<sub>2</sub>-1 (D), NiPd/C@SiO<sub>2</sub>-3 (E), NiPd/C@SiO<sub>2</sub>-6 (F).

**Table S1** ICP data of different samples and comparison for the reduction of 4-NP.

Catalyst	Ni(μg/mg)	k(*10 <sup>-3</sup> s <sup>-1</sup> )	κ(*10 <sup>-3</sup> mg <sup>-1</sup> ·s <sup>-1</sup> )

Ni/C@SiO <sub>2</sub> -500°C	33.04	1.556	10.47
Ni/C@SiO <sub>2</sub> -700°C	25.51	7.310	88.72
Ni/C@SiO <sub>2</sub> -900°C	27.41	1.716	13.91

**Table S2** ICP data of different samples and comparison for the reduction of 4-NP.

Catalyst	Ni(μg/mg)	Pd(μg/mg)	k(*10 <sup>-3</sup> s <sup>-1</sup> )	κ(*10 <sup>-3</sup> mg <sup>-1</sup> ·s <sup>-1</sup> )
NiPd/C@SiO <sub>2</sub> -1	57.76	81.81	4.690	134.4
NiPd/C@SiO <sub>2</sub> -3	50.83	146.1	4.959	100.7
NiPd/C@SiO <sub>2</sub> -6	49.05	324.7	5.767	61.70