

MOF-derived Ni-based nanocomposites as robust catalysts for chemoselective hydrogenation of functionalized nitro compounds

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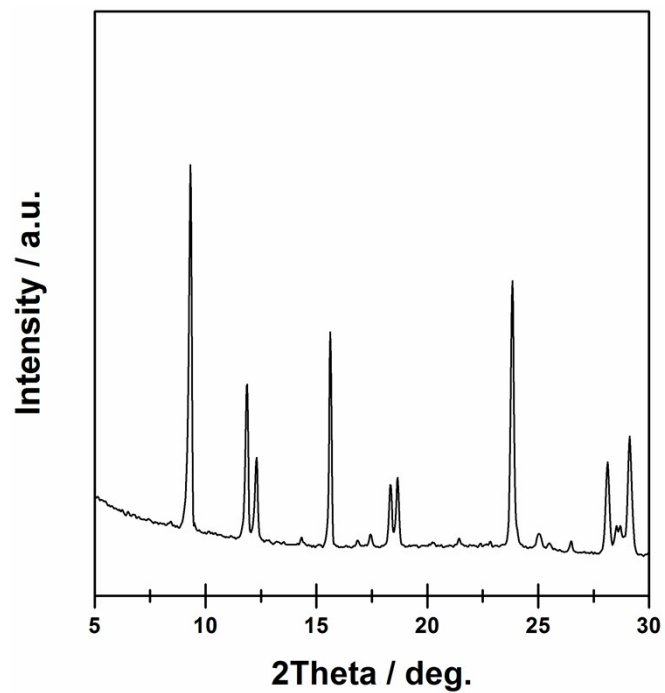


Fig. S1 XRD patterns of as-synthesized Ni-MOF.

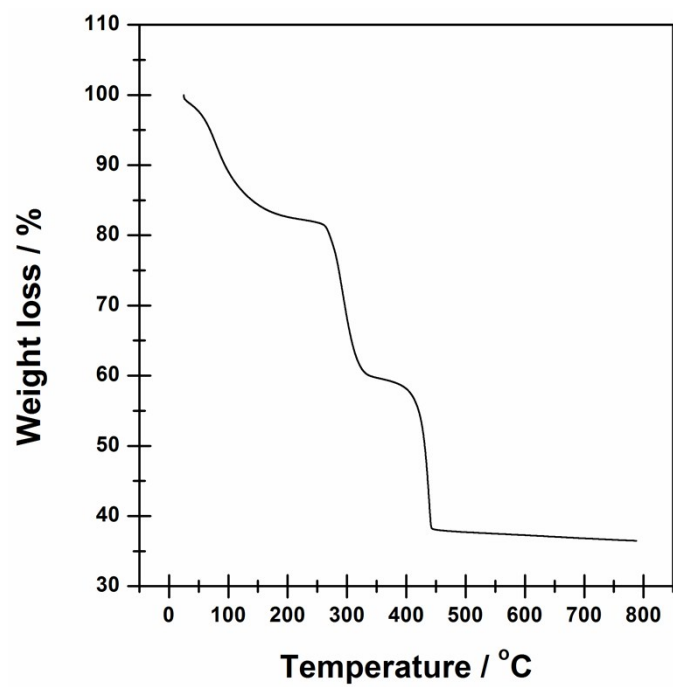


Fig. S2 TGA curve of as-synthesized Ni-MOF

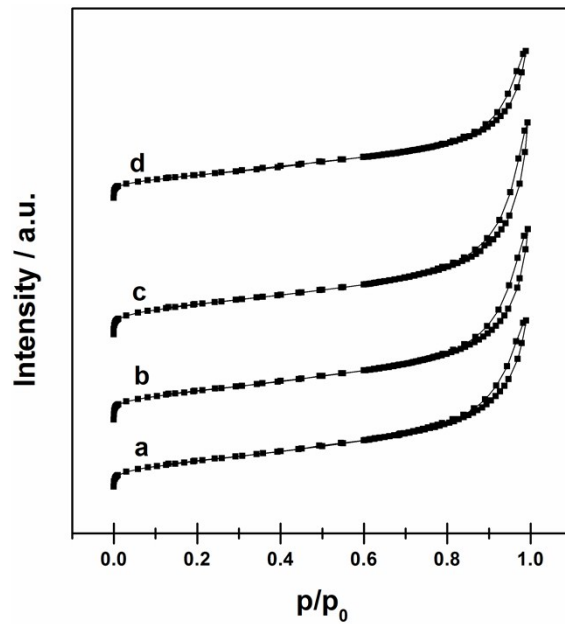


Fig. S3 N₂ adsorption-desorption isotherms of Ni@C-450 (a), Ni@C-550 (b), Ni@C-650 (c), and Ni@C-750 (d).

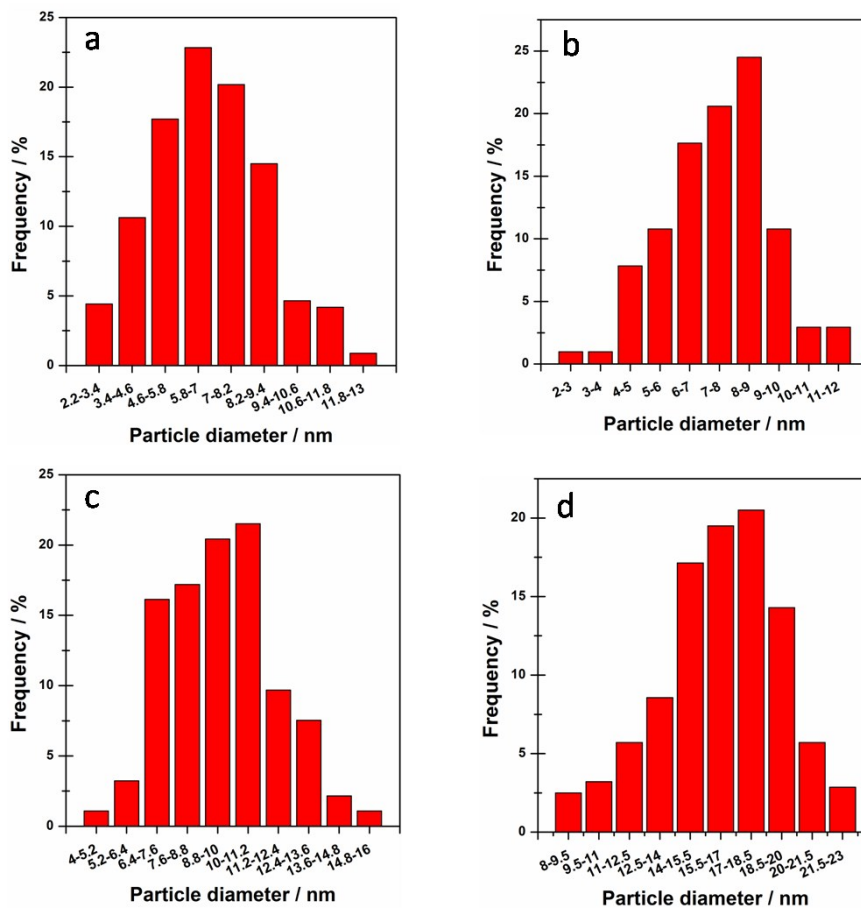


Fig. S4 The size distribution of Ni nanoparticles in Ni@C-450 (a), Ni@C-550 (b), Ni@C-650, and Ni@C-750.

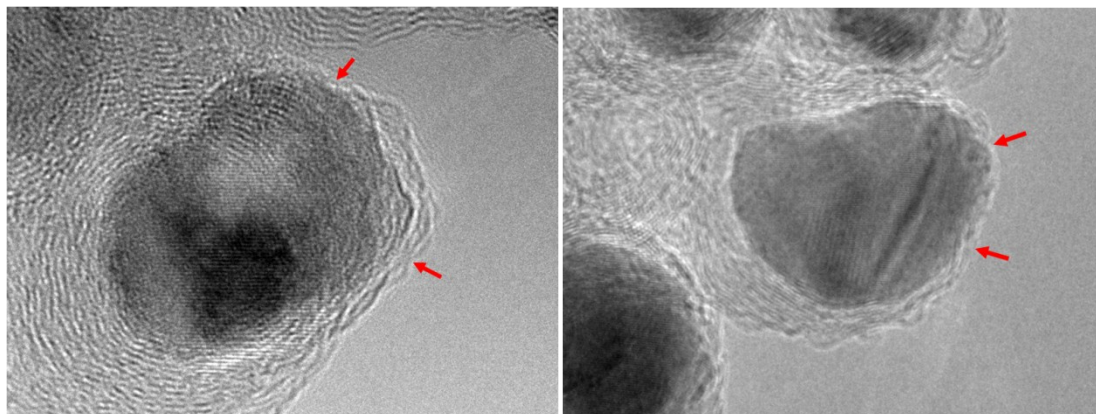


Fig. S5 HRTEM images of individual Ni nanoparticles covered by thin carbon layers with cracks marked by red arrow.

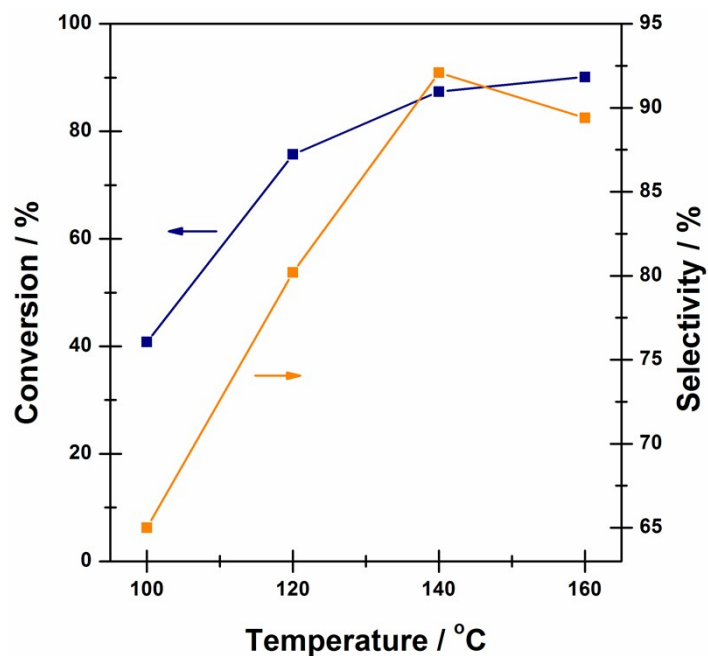


Fig. S6 Effect of temperature on the hydrogenation of *o*-chloronitrobenzene. Reaction conditions: 0.63 mmol *o*-chloronitrobenzene, 10 mL C₂H₅OH, 0.5 Mpa H₂, 0.1 g catalyst, temperature = 140 °C, reaction time = 30 min.

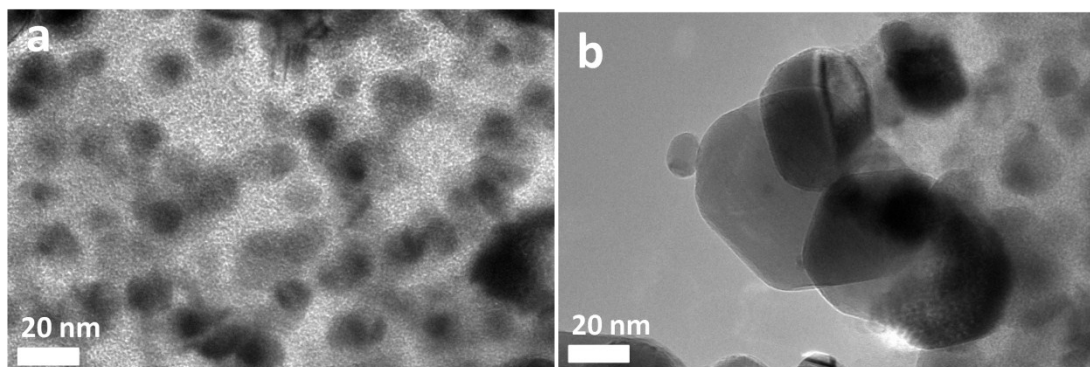


Fig. S7 TEM images of Ni/AC before (a) and after use.

Table S1 Effect of solvent on the hydrogenation of *o*-chloronitrobenzene^a

Entry	Catalyst	Solvent	Conversion (%) ^b	Selectivity (%) ^b
1	Ni@C-650	C ₂ H ₅ OH	99.4	94.2
2	Ni@C-650	THF	20.8	78.1
3	Ni@C-650	Toluene	18.7	76.2
4	Ni@C-650	DMF	76.7	72.1
5	Ni@C-650	Dioxane	23.8	72.9
6	Ni@C-650	THF+H₂O	90.5	78.5
7	Ni@C-650	H ₂ O	83.8	65.7

Reaction conditions: 0.63 mmol *o*-chloronitrobenzene, 10 mL solvent, 0.5 Mpa H₂, 0.1 g catalyst, temperature = 140 °C, reaction time = 40 min. ^b Experimental accuracy of ±2% from GC analysis.