Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Synthesis of Highly Active Carbon-encapsulated Ni_2P Catalysts by One-step Pyrolysis–phosphidation for Hydrodeoxygenation of Phenolic Compounds

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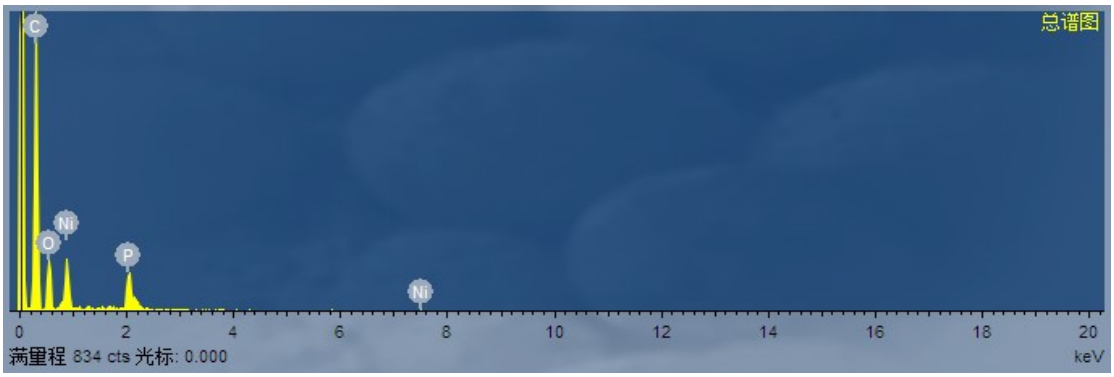

Fig. S1 EDS spectrum Ni $_2$P@C(3) catalyst.

Table. S1 Quantitative elemental analysis of Ni_2P@C(x)

Catalysts	Ni	P	O	C	Ni/P
Ni_2P@C(1)	8.9	3.7	17.1	70.3	2.43
Ni_2P@C(3)	8.9	8.5	13.7	68.9	1.04
Ni_2P@C(5)	8.8	10.5	14.4	66.3	0.84
Ni_2P@C(7)	8.6	12.0	14.2	65.2	0.72
Ni_2P@C(10)	8.5	13.5	13.6	64.4	0.63

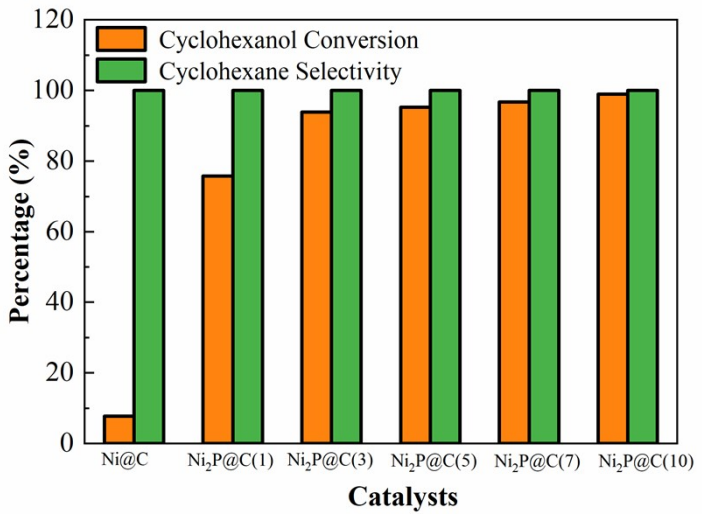

Fig. S2 Dehydration of cyclohexanol over Ni@C and Ni_2P@C(x) catalysts.
Reaction conditions: T=250 ℃, P=2 MPa, t=2 h

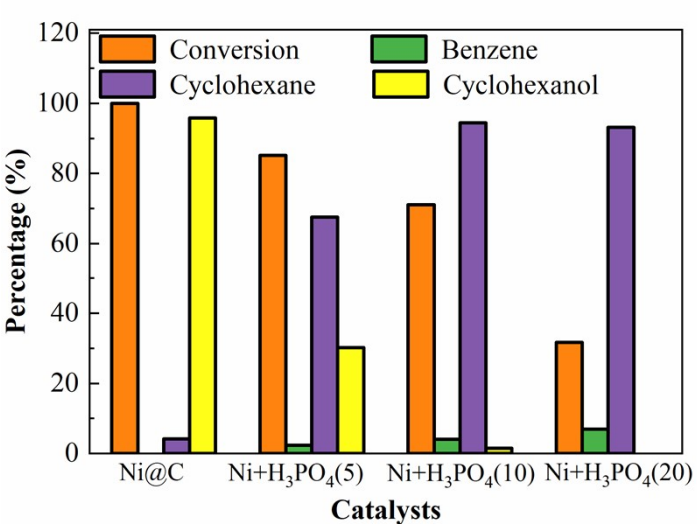

Fig. S3 HDO of phenol over Ni@C, and Ni+H_3PO_4(*y*) catalysts. Reaction conditions: *T*=250 ℃, *P*=2 MPa, *t*=2 h.

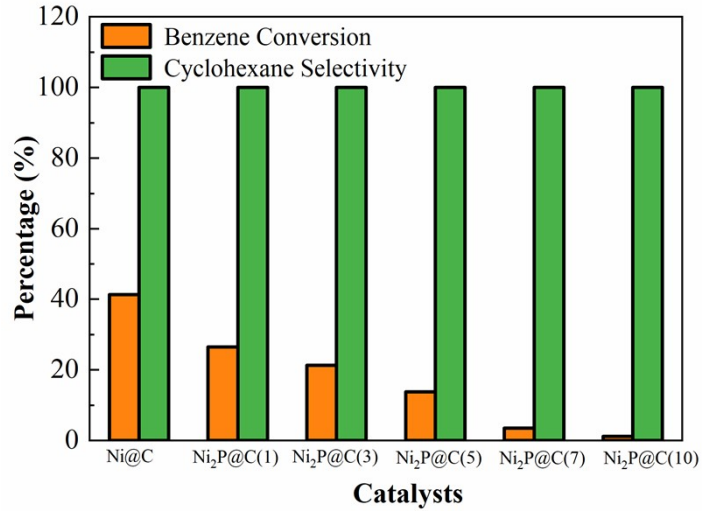

Fig. S4 Hydrogenation of benzene over Ni@C and Ni_2P@C(*x*) catalysts. Reaction conditions: T=250 ℃, P=2 MPa, t=2 h

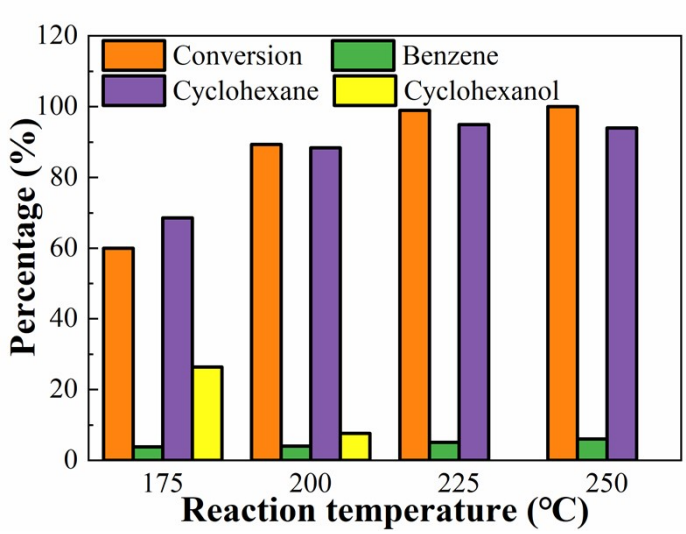

Fig. S5 Effect of reaction temperature on HDO of phenol over Ni_2P@C(3). Reaction conditions: *P*= 2 MPa, *t*= 2 h.

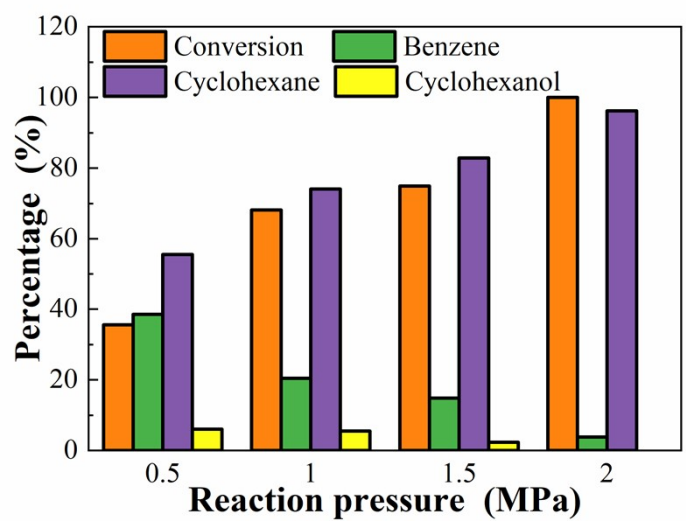

Fig. S6 Effect of reaction pressure on HDO of phenol over Ni_2P@C(3). Reaction conditions: *T*=250 ℃, *t*=2 h.

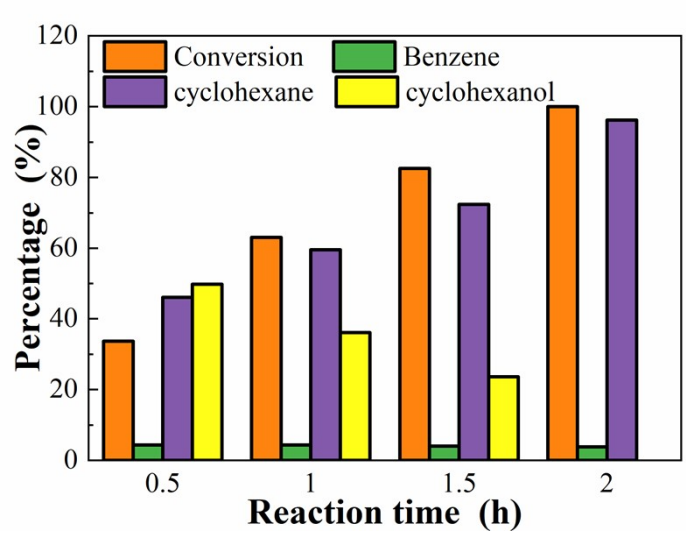

Fig. S7 Effect of reaction time on HDO of phenol over Ni_2P@C(3).
Reaction conditions: *T*= 250 °C *P*=2 MPa,