

Article

Supporting Materials: Dehydrogenation Catalysts for Synthesis of O-Phenylphenol via Cu/Ni/Mg/Al Hydrotalcite-Like Compounds as Precursors

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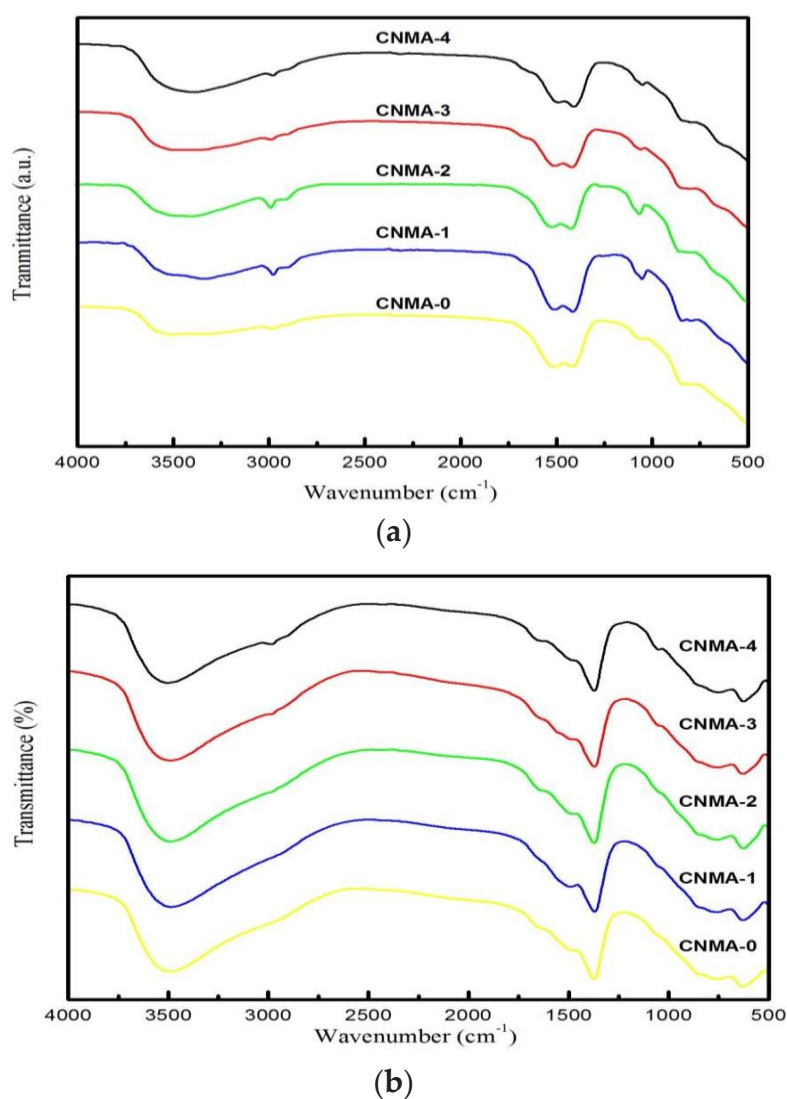


Figure S1. FT-IR image of Cu/Ni/Mg/Al before calcination (a) and calcination (b).

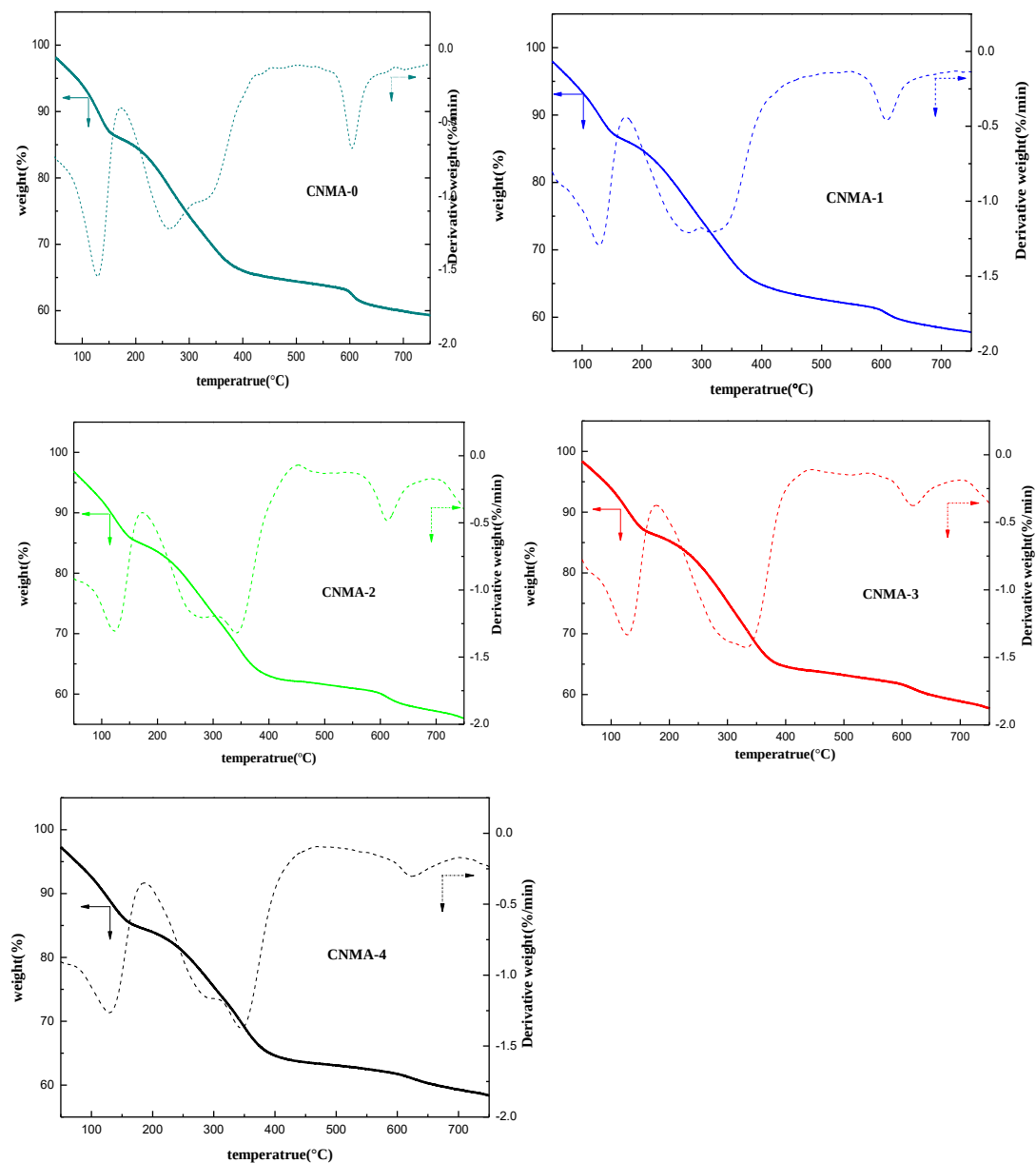


Figure S2. TG-DTG of the precursors in N₂.

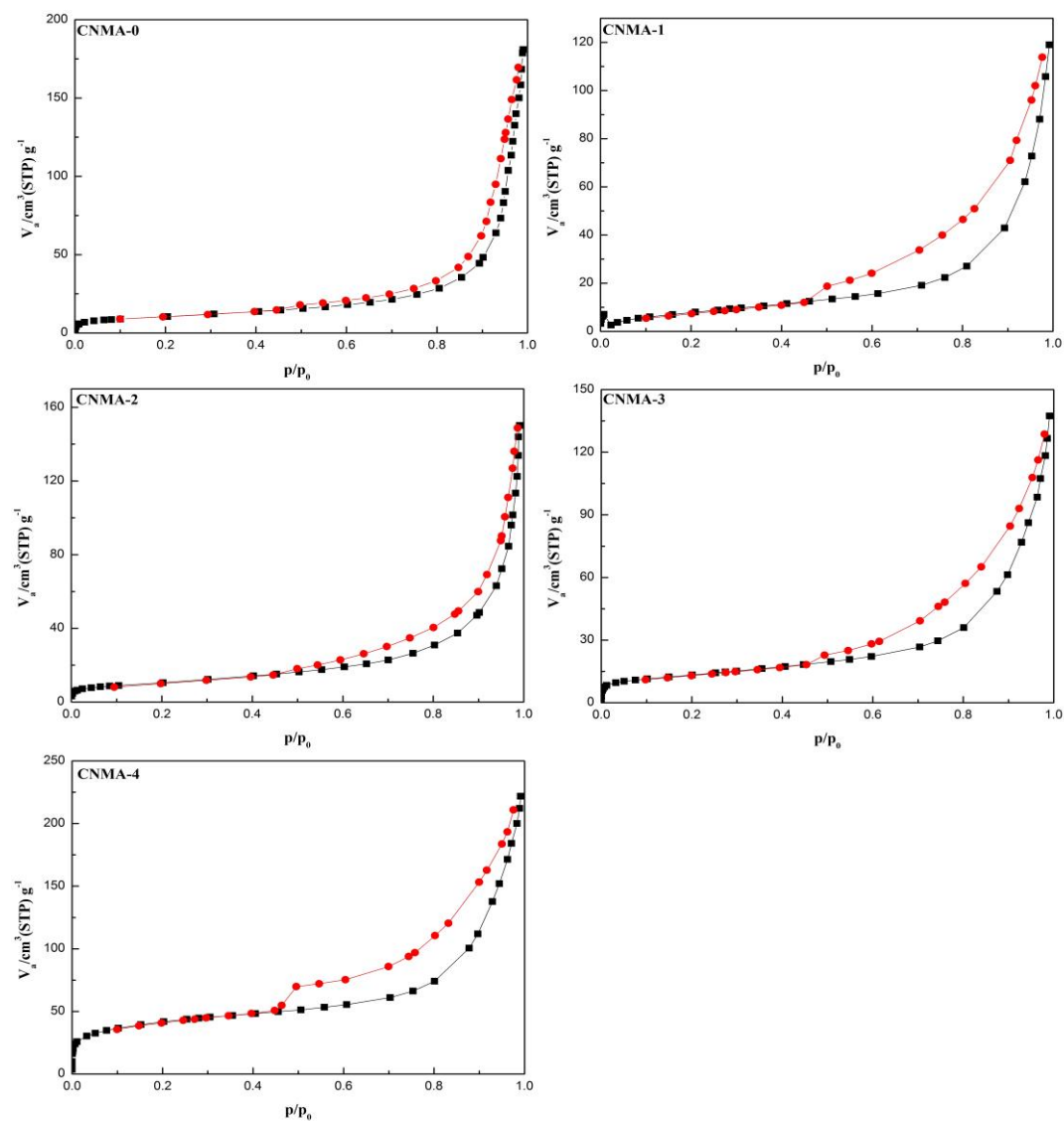
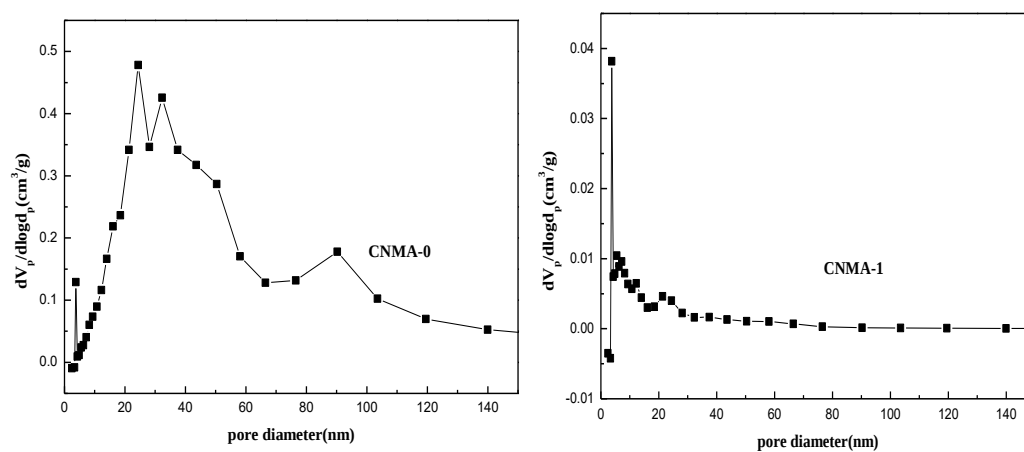


Figure S3. N₂ adsorption-desorption isotherms of CNMA-(0-4).



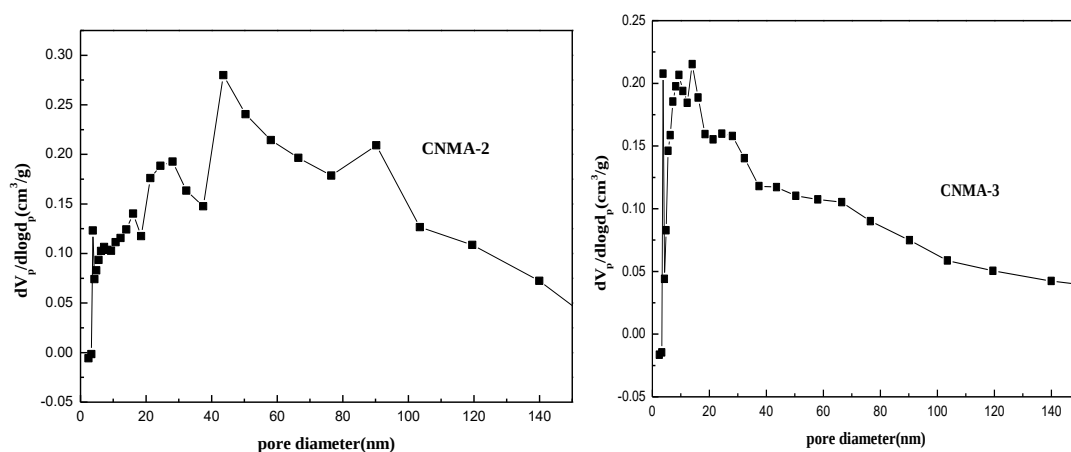


Figure S4. The pore size distributions for all catalysts.

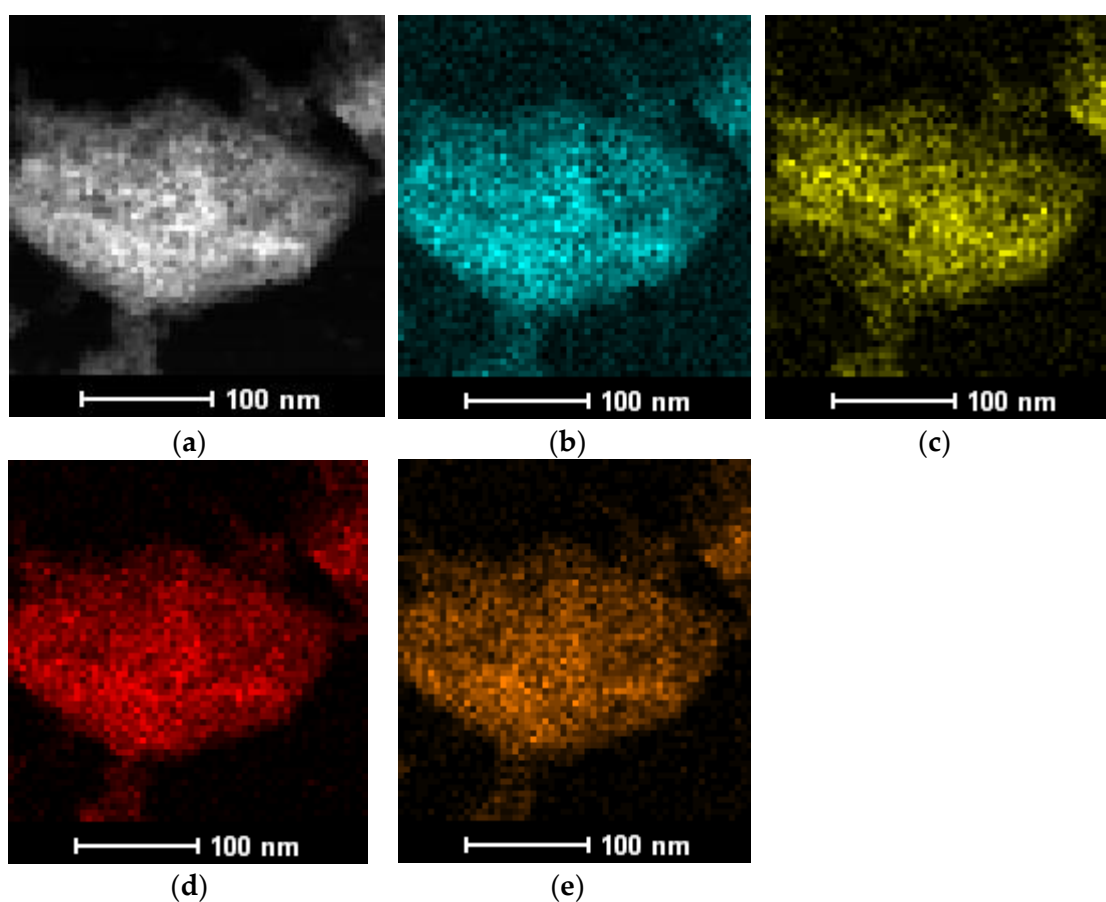


Figure S5. HRTEM and elemental mapping images of catalysts after reduction (a) Cu/Mg/Al/Ni catalysts (b) Cu -K map (c) Ni-K map (d) Mg-K map (e) Al-K map.

Table S1. FWHM and the size of Cu⁰ particles by XRD.

Sample	n _{Cu} :n _{Ni} :n _{Mg} :n _{Al} molar ratio	FWHM (θ) ^a	d(Cu ⁰) _{XRD} (nm)
CNMA-0	2.5:0:3.5:2	1.562	5.5
CNMA-1	2.25:0.25:3.5:2	1.862	4.6
CNMA-2	2:0.5:3.5:2	2.004	4.3
CNMA-3	1.75:0.75:3.5:2	2.123	4.0
CNMA-4	1.5:1:3.5:2	2.447	3.5

^a The FWHM of the Cu⁰ particles.**Table S2.** The properties of the samples with different amount of Ni.

Catalysts	Surface (m ² ·g ⁻¹)	Pore volume (cm ³ ·g ⁻¹)	Average pore diameter(nm)
CNMA-0	37	0.2789	29.946
CNMA-1	32	0.1789	21.961
CNMA-2	37	0.2286	24.251
CNMA-3	47	0.2095	17.749
CNMA-4	144	0.3331	9.1947

Table S3. Temperatures for Reduction peak and the percentage of α peak for these samples.

Sample No.	T _α (°C)	T _β (°C)	T _γ (°C)	A _α /(A _α +A _β +A _γ) %
CNMA-0	186	286	-	12.07
CNMA -1	248	283	-	17.58
CNMA -2	259	307	413	52.97
CNMA -3	237	295	392	27.67
CNMA -4	295	386	-	77.60

Table S4. Distribution of the basic type for the samples with different Ni amount.

Sample No.	TPD peak position [temperature (°C)] & (Area)	
	Site α	Site β
CNMA -0	-	-
CNMA -1	244 (0.14)	299(2.12)
CNMA -2	247 (0.33)	311 (3.25)
CNMA -3	248 (0.21)	310 (1.43)
CNMA -4	258(1.02)	326(4.50)



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