

## Supporting Information

### **Conversion of CO<sub>2</sub> into Cyclic Carbonate Catalyzed by N-Doped Mesoporous Carbon Catalyst**

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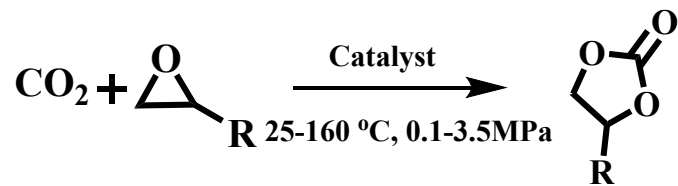
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Scheme S1. The cycloaddition of CO<sub>2</sub> with epoxides.

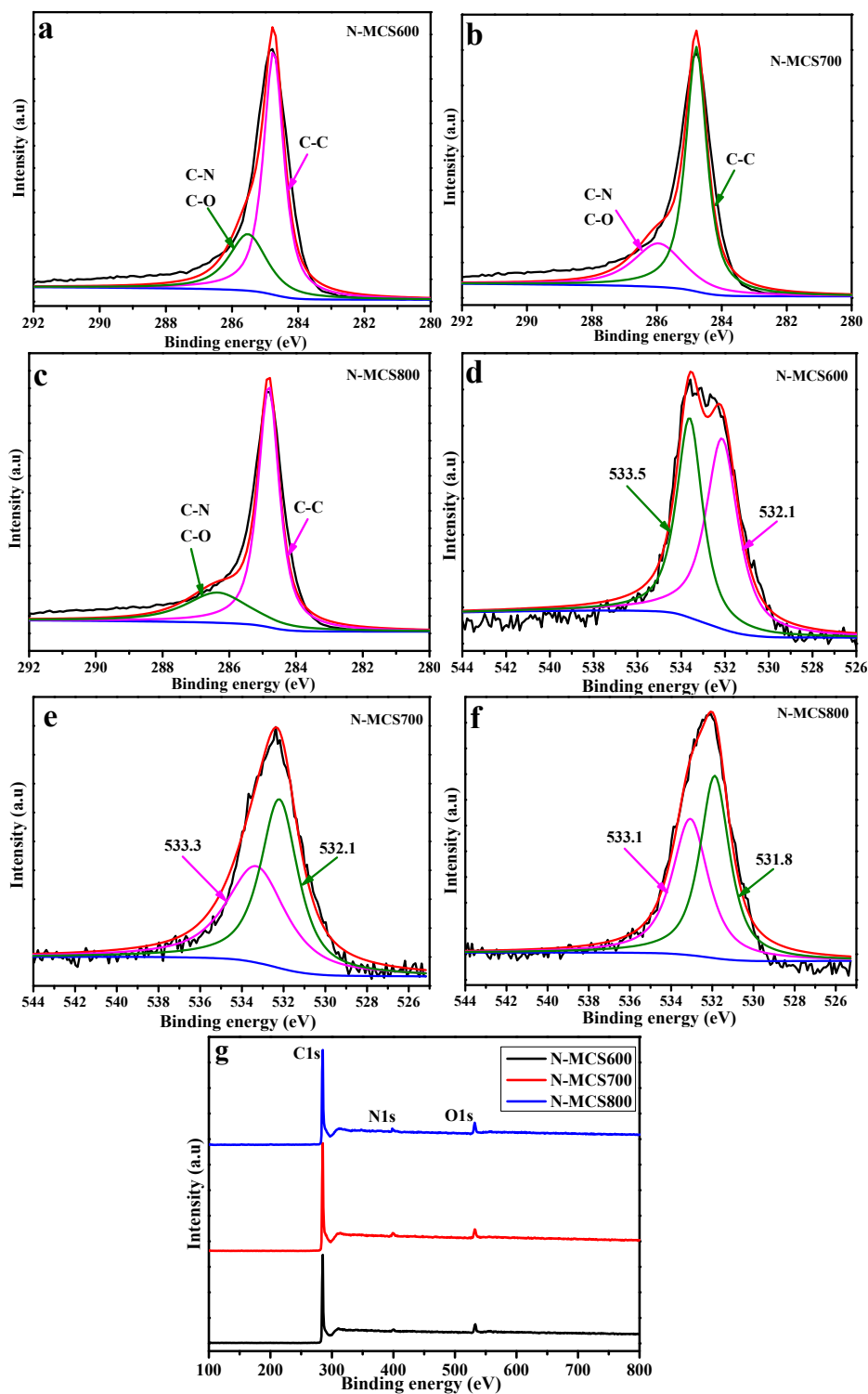


Figure S1. The C1s (a-c), O1s (d-f) and XPS survey spectra (g) of different N-MCS samples.

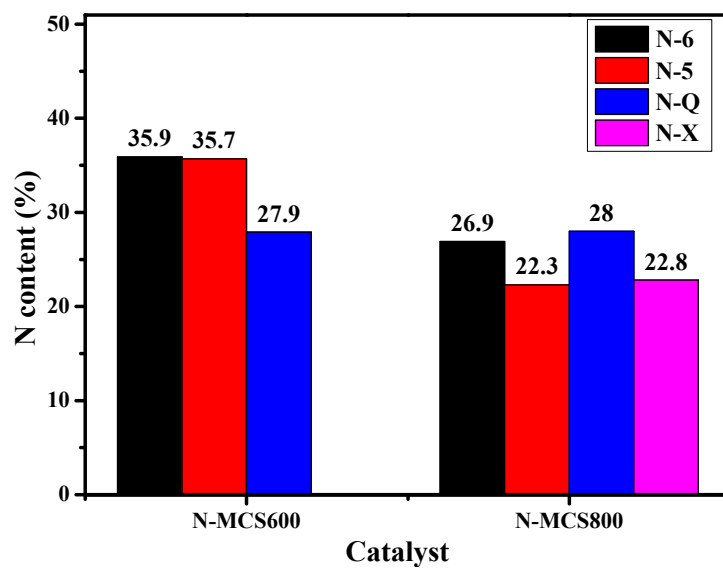


Figure S2. The N percentage composition of different N-MCS materials measured by XPS.

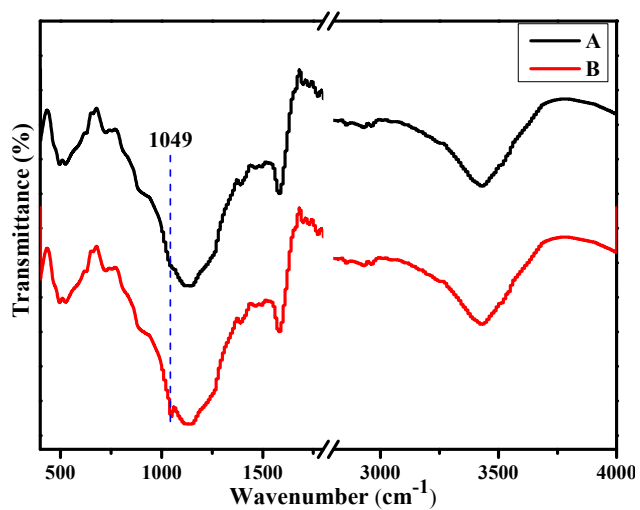


Figure S3. FT-IR spectra of N-MCS800 before (A) and after (B) interaction with CO<sub>2</sub>.

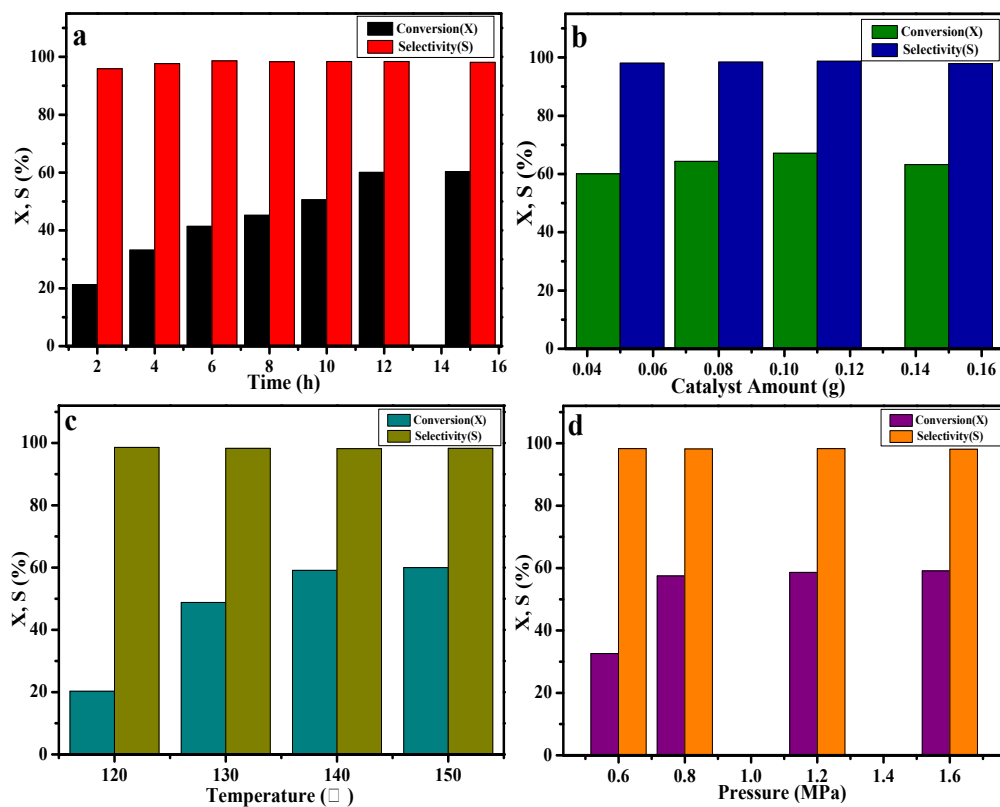


Figure S4. Impacts of reaction conditions on the cycloaddition of CO<sub>2</sub> with ECH: (a) reaction time, (b) catalyst amount, (c) reaction temperature, (d) reaction pressure.

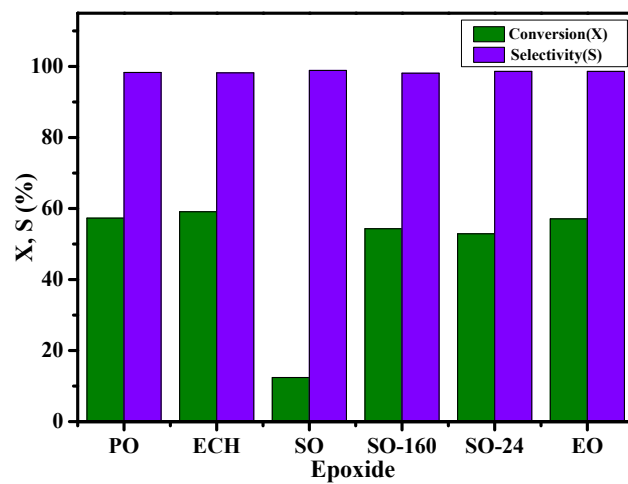


Figure S5. Coupling of CO<sub>2</sub> and various epoxides.

SO-160: The reaction temperature is 160 °C. SO-24: The reaction time is 24 h.

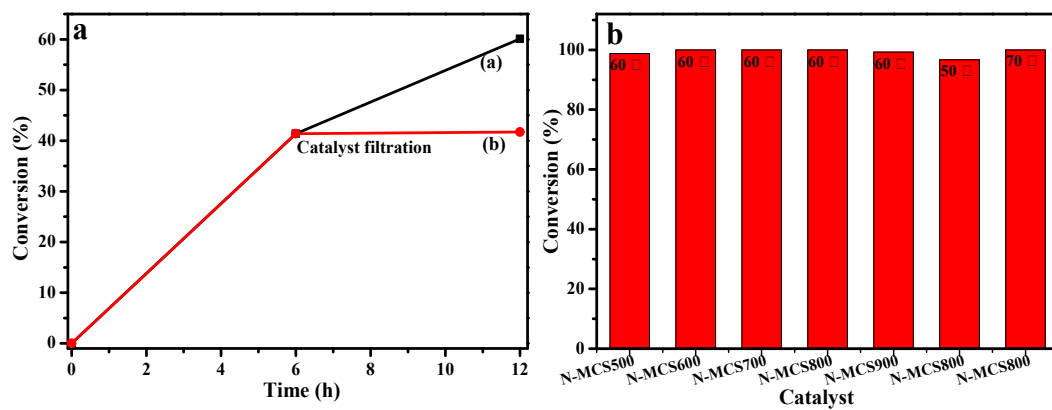


Figure S6. (a) Cycloaddition of CO<sub>2</sub> with ECH over (a) N-CMS800 and (b) in the filtrate solution (catalyst filtered off after 6 h), (b) Knoevenagel condensation reaction.

Table S1. Texture parameters of various N-MCS materials.

Entry	Catalyst	$S_{\text{BET}}$ ( $\text{m}^2\text{g}^{-1}$ )	$V_{\text{Meso}}$ ( $\text{cm}^3\text{g}^{-1}$ )	$I_{\text{D}}/I_{\text{G}}$	Basic amount ( $\text{mmol}\cdot\text{g}^{-1}$ )		
					Weak base <sup>a</sup>	Strong base <sup>b</sup>	Total base
1	N-MCS600	599.5	0.89	0.88	0.47	0.59	1.06
2	N-MCS700	634.7	0.95	0.95	0.49	0.64	1.13
3	N-MCS800	1341.9	1.47	1.00	0.70	0.89	1.59
4	Reused N- MCS800	1298.7	1.44	-	-	-	-

<sup>a</sup> Measured at 50-250 °C; <sup>b</sup> Measured at 250-600 °C.



Table S2. The comparison of CN catalysts for the cycloaddition of CO<sub>2</sub> and ECH.

Entry	Catalyst	Pres./ MPa	Temp./ °C	Time/ h	Yield/ %	Ref.
1	N-MCS800	0.8	140	12	58.2	This work
2	N-MCS800 <sup>a</sup>	0.8	100	12	99.1	This work
3	UF-MCN <sup>b</sup>	0.8	100	10	34.0	[1]
4	prop-Br/NOMC-450-140 <sup>c</sup>	2.5	150	10	65.0	[2]
5	ZnBr <sub>2</sub> /g-C <sub>3</sub> N <sub>4</sub> <sup>d</sup>	2.0	140	6	52.0	[3]
6	u-g-C <sub>3</sub> N <sub>4</sub> -480 <sup>e</sup>	2.0	130	4	23.7	[4]
7	ZnBr <sub>2</sub> /mp-C <sub>3</sub> N <sub>4</sub> <sup>f</sup>	2.5	140	6	10.4 (96.8) <sup>o</sup>	[5]
8	MS-CN <sup>g</sup>	0.8	140	10	30.6	[6]
9	g-C <sub>3</sub> N <sub>4</sub> /SBA-15 <sup>h</sup>	3.5	150	1.5	28.8 (96.1) <sup>o</sup>	[7]
10	Zn-C <sub>3</sub> N <sub>4</sub> <sup>i</sup>	2.0	130	5	7.0 (91.0) <sup>o</sup>	[8]
11	g-C <sub>3</sub> N <sub>4</sub> /TBAB <sup>j</sup>	3.5	150	1.5	28.8 (94.5) <sup>o</sup>	[9]
12	g-C <sub>3</sub> N <sub>4</sub> -450-NaOH <sup>k</sup>	2.0	140	6	3.7 (79.2) <sup>o</sup>	[10]
13	P-C <sub>3</sub> N <sub>4</sub> -2 <sup>l</sup>	2.0	100	4	20.8 (99.8) <sup>o</sup>	[11]

<sup>a</sup>: ZnBr<sub>2</sub> was used as co-catalyst. <sup>b</sup>: prepared using disk-shaped 2D hexagonal mesoporous silica as a hard template, urea and formaldehyde resin as precursors. <sup>c</sup>: prepared through a soft templating method and then utilized as supports to immobilize alkyl bromide. <sup>d</sup>: ZnBr<sub>2</sub> supported on a g-C<sub>3</sub>N<sub>4</sub> material. <sup>e</sup>: prepared using urea as a starting material without addition of any template. <sup>f</sup>: ZnBr<sub>2</sub> supported on a mp-C<sub>3</sub>N<sub>4</sub> material. <sup>g</sup>: prepared using disk-shaped 2D hexagonal mesoporous silica as a hard template and melamine as a precursor. <sup>h</sup>: prepared using SBA-15 as a catalytic support and dicyandiamide as a precursor through a chemical vapor deposition method. Zn<sup>2+</sup> was further doped into g-C<sub>3</sub>N<sub>4</sub>/SBA-15 as an additive. <sup>i</sup>: Zn modified carbon nitride catalyst and KI was used as co-catalyst. <sup>j</sup>: Tetrabutylammonium bromide (TBAB) was used as co-catalyst. <sup>k</sup>: synthesized using guanidine hydrochloride as a precursor treated with NaOH and ZnI<sub>2</sub> was used as co-catalyst. <sup>l</sup>: prepared by direct thermolysis of melamine, hexachlorotriphosphazene and Bu<sub>4</sub>NBr was used as co-catalyst. <sup>o</sup>: the values in brackets are obtained in the presence of co-catalyst.

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