

## Electronic Supporting Information (ESI)

### Support Morphology and Crystal-plane Effect of Cu/CeO<sub>2</sub> Nano-Material on the Physicochemical and Catalytic Properties for Carbonate Hydrogenation

Table S1 Physicochemical properties of different morphologies ceria

Catalyst	S <sub>BET</sub> (m <sup>2</sup> /g)	V <sub>pore</sub> (cm <sup>3</sup> /g)	D <sub>pore</sub> (nm)
CeO <sub>2</sub> -NR	86.3	0.56	25.2
CeO <sub>2</sub> -NP	138.8	0.19	6.1
CeO <sub>2</sub> -NC	8.5	0.06	34.5

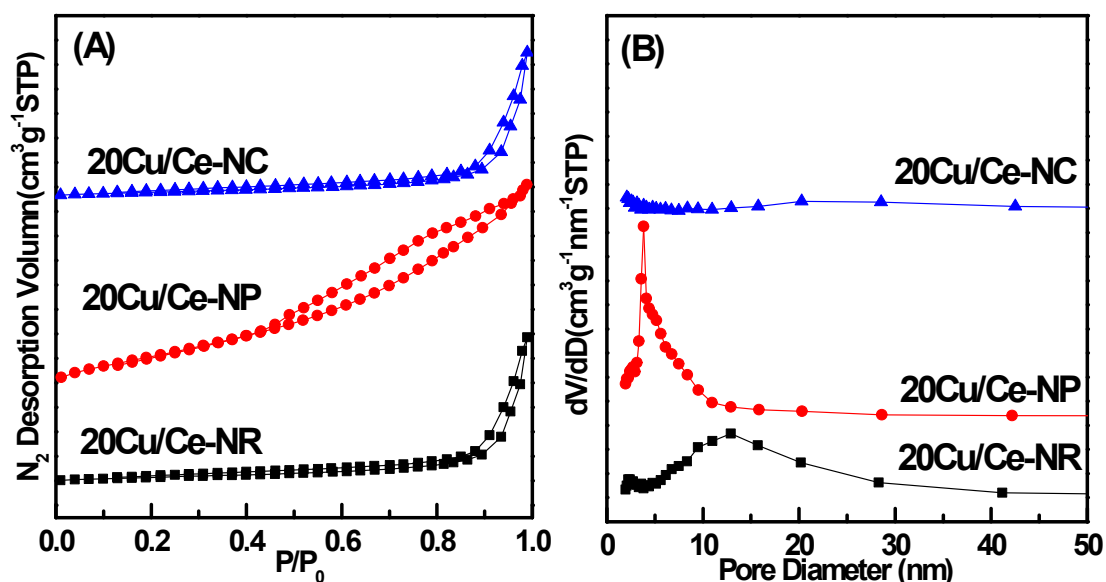
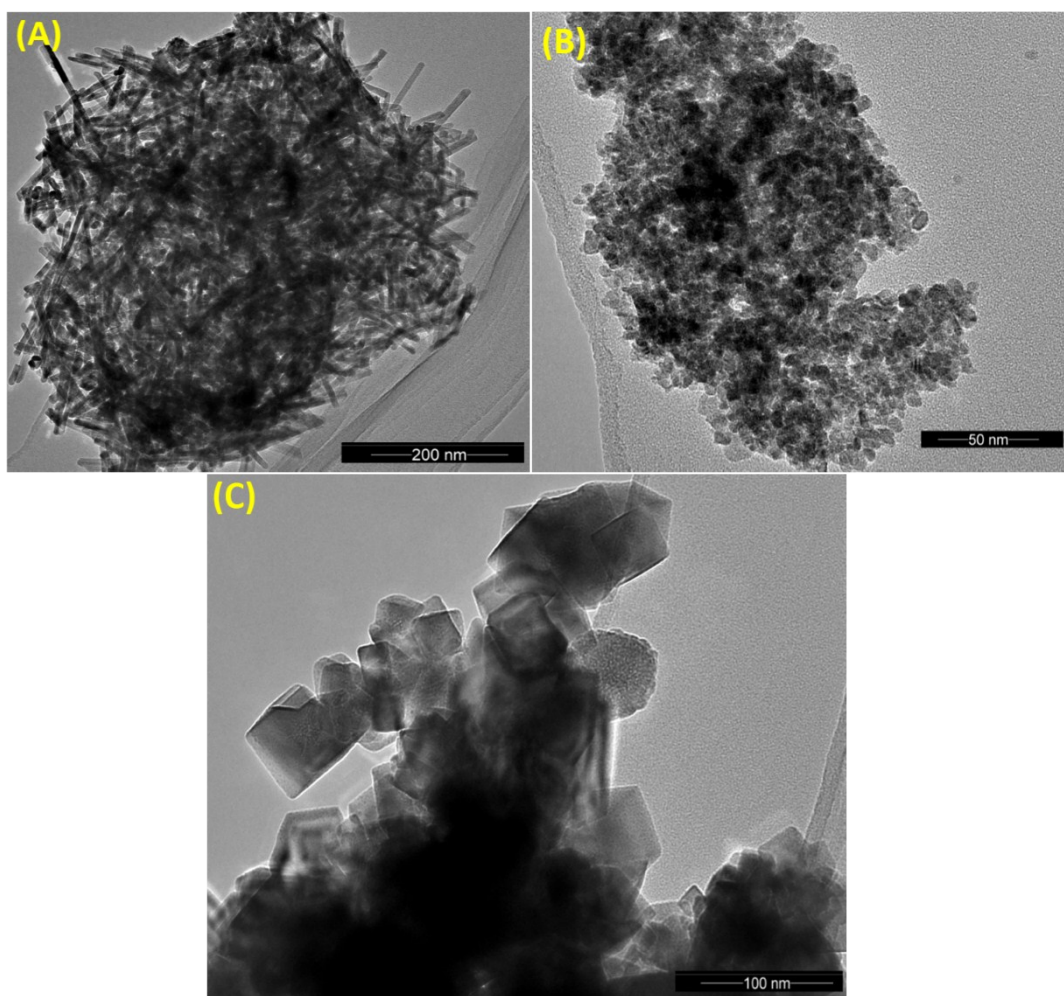


Fig. S1† N<sub>2</sub> adsorption-desorption isotherms and BJH pore size distribution of the calcined catalysts.



**Fig. S2†** HRTEM images of 20Cu/Ce-NR (A), 20Cu/Ce-NP (B) and 20Cu/Ce-NC (C).

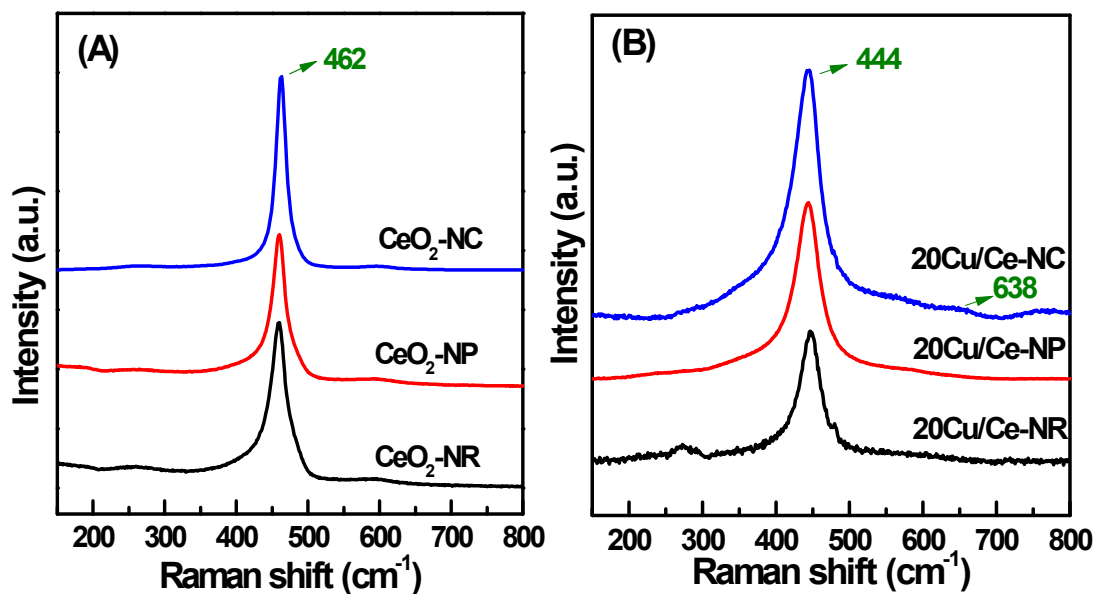


Fig. S3† Raman spectra of various CeO<sub>2</sub> (A) and 20Cu/CeO<sub>2</sub> samples (B).

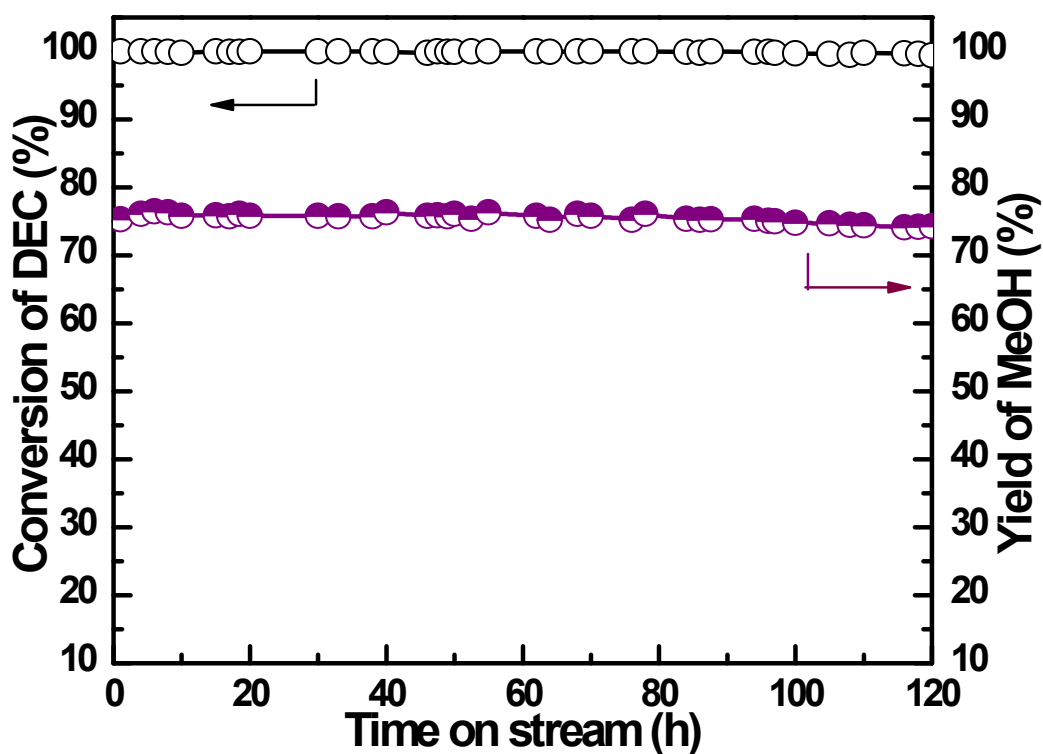
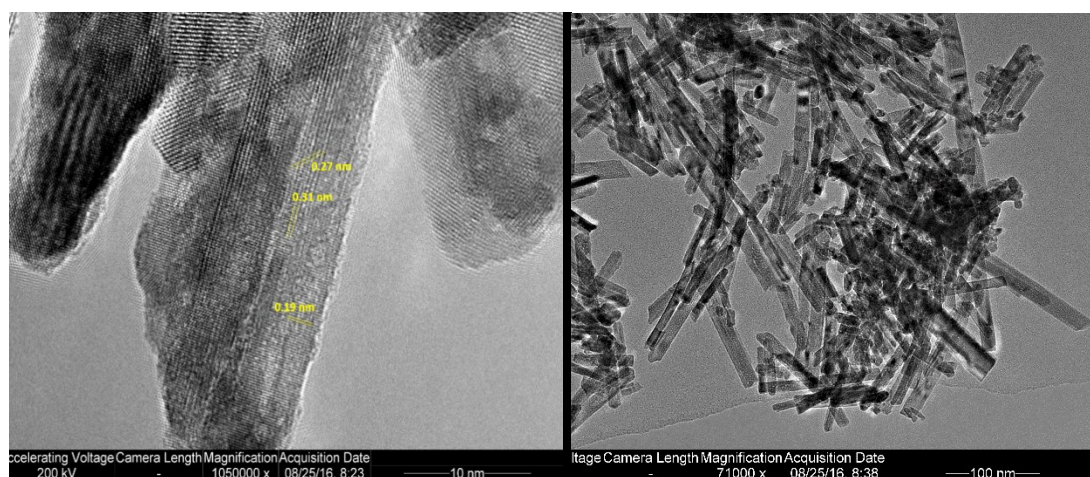


Fig. S4† Long time catalytic test results of 20Cu/Ce-NR. Reaction condition: P=2.5

MPa, T=503 K, H<sub>2</sub>/DEC=190 (mol/mol), LHSV=0.4 h<sup>-1</sup>.



**Fig. S5†** HRTEM images of 20Cu/Ce-NR catalysts after the 1st run