

Supporting Information

Supported Cobalt Nanoparticles with a Single Active Phase for Fischer-Tropsch Synthesis

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Author Contributions

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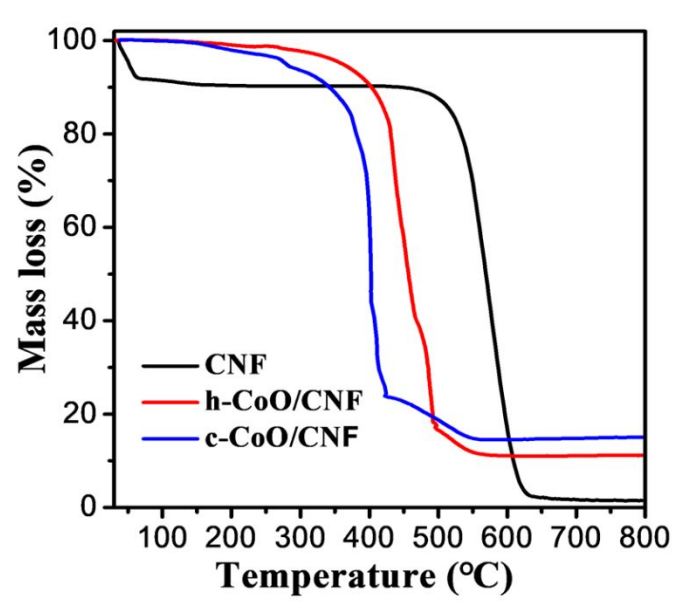


Figure S1. TGA profiles of CNF and CoO/CNF materials. The experiment was performed in air at a heating rate of 10 K min⁻¹.

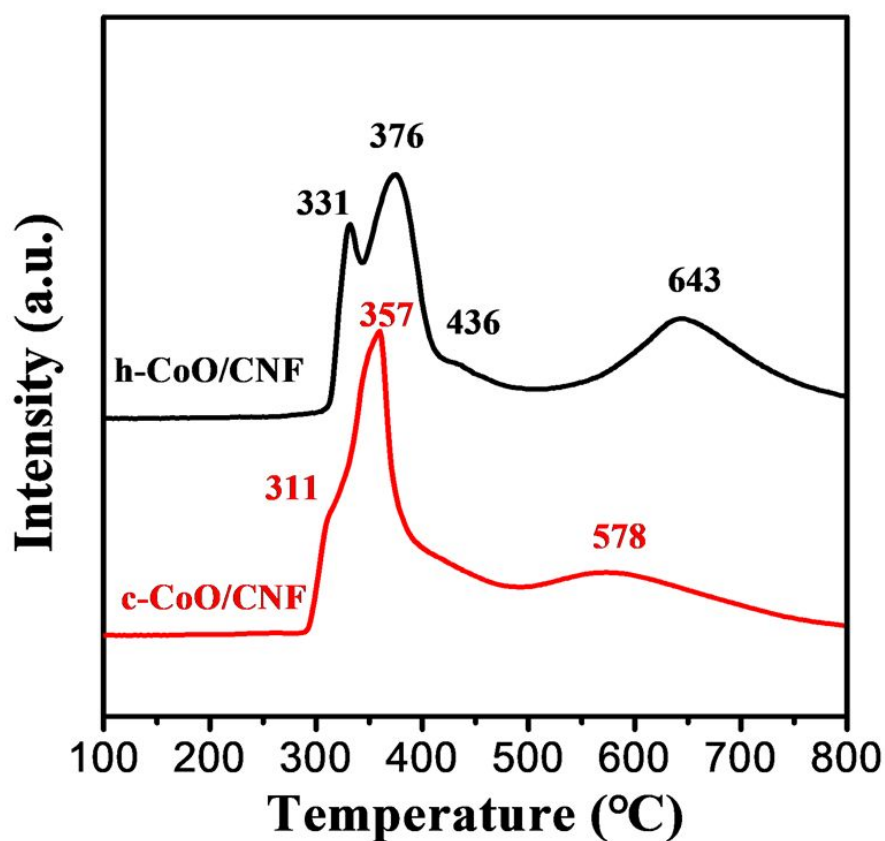


Figure S2. H₂-TPR profile of h-CoO/CNF and c-CoO/CNF. Conditions: 50 mg of CoO, H₂/Ar=1/9 (mol/mol), flow rate 30 mL min⁻¹, temperature ramp 10 K min⁻¹.

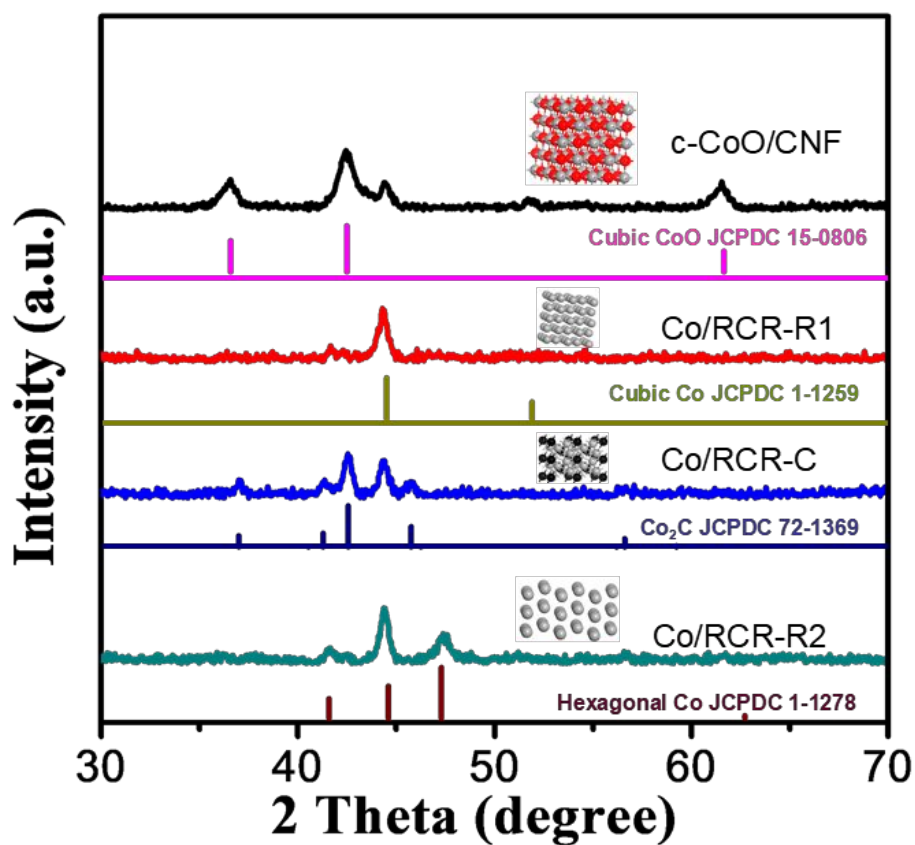


Figure S3 Phase evolution in reduction-carburization-reduction (RCR) process.

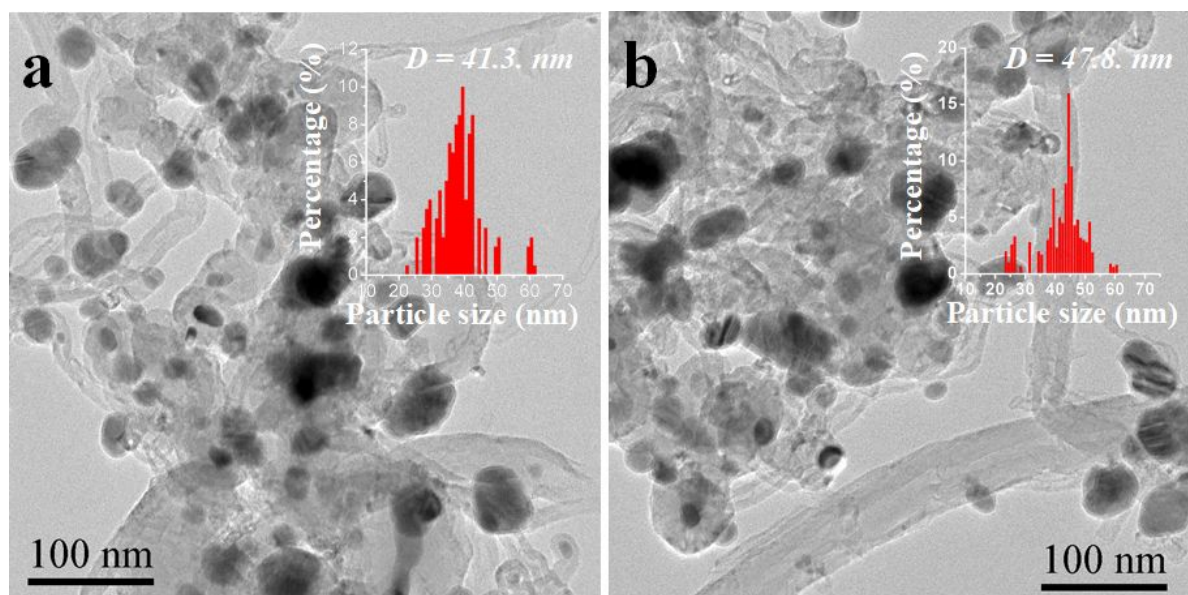


Figure S4. TEM and size distribution of (a) Co/RCR-C and (b) Co/RCR-R2 (size distribution is shown in the insets).

Table S1 Dispersion and cobalt particle size data of Co catalysts supported on the carbon nanofibers.

Catalysts	H ₂ desorbed (umol/g)	Dispersion (%)	Cobalt particle size (nm)			Cobalt loading (wt. %)
			H ₂ chemisorption ^a	TEM ^b	XRD ^c	
hcp-Co/CNF	49.7	3.3	17.4	23.1	18.6	6.2
fcc-Co/CNF	82.8	6.7	14.4	22.4	18.4	8.3
Co/RCR	--	--	--	47.8	--	8.3

^a The cobalt particle size calculated using the following equation: $d = 0.96/\text{dispersion}$.

^b The surface-average cobalt particle size was obtained from TEM.

^c The average cobalt particle size was determined by XRD (Scherrer equation) at $2\theta=41.6^\circ$ for hcp-Co and $2\theta=51.9^\circ$ for fcc-Co.

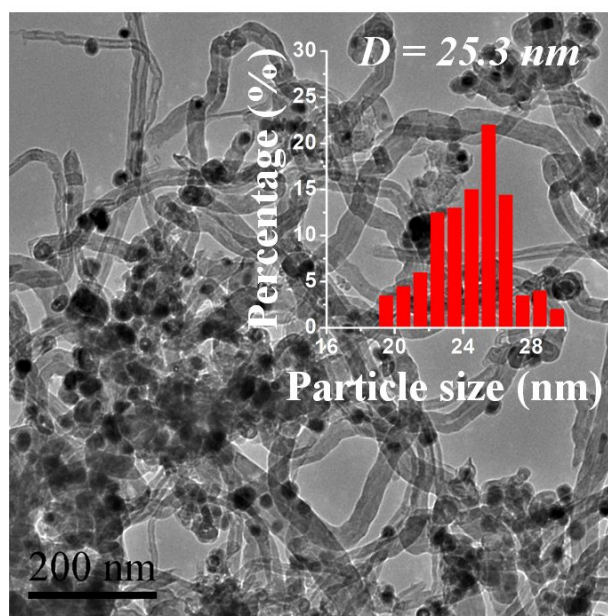


Figure S5 TEM image (the inset is size distribution) of fcc-Co/CNF catalyst after reaction.

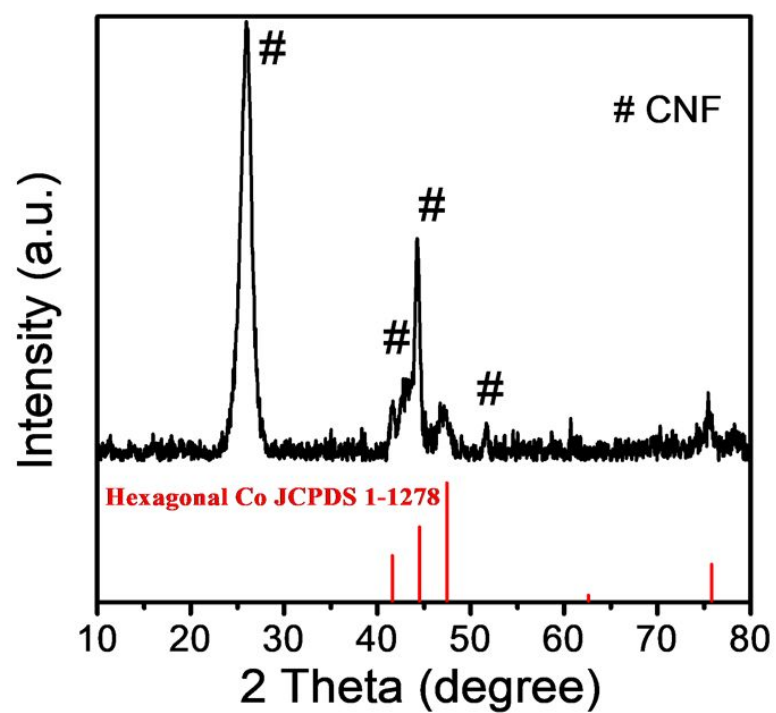


Figure S6 XRD pattern of hcp-Co/CNF catalyst after reaction.