Supporting Information

Coupled Metal/Oxide Catalysts with Tunable Product Selectivity for Electrocatalytic CO_2 Reduction

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Table S1. The recipes for synthesizing the CuO_y/SnO_x-CNT materials.

#	1	2	3	4	5	6	7	8	9	10	11	12	13
C_{SnCl_2} / M	0	0.001	0.0025	0.005	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
V_{SnCl_2}	0	2.5 μL	2.5 μL	2.5 μL	10 μL	100 μL	330 μL	0.5 mL	0.75 mL	1 mL	1.5 mL	2 mL	8 mL
$C_{Cu(OAc)_2}$							0.02 M						
$V_{Cu(OAc)_2}$ / mL	8	8	8	7.999	7.99	7.9	7.67	7.5	7.25	7	6.5	6	0
C_{CNT}							4 mg/mL						
V_{CNT}							2 ml						
C_{KOH}							0.5 M						
V_{KOH} / μL	600	605	610	620	630	640	730	670	690	710	760	830	1000

Table S2. Designed and measured (by XRF) Y_{Sn} atomic ratios for the CuO_y/SnO_x-CNT materials.

#	1	2	3	4	5	6	7	8	9	10	11	12	13
Measured Y_{Sn} Sn/(Sn+Cu) %	0	0.01	0.014	0.029	0.275	2.65	6.20	9.31	13.16	21.05	25.38	30.21	100
Designed Y_{Sn} value %	0	1.56×10^{-3}	3.91×10^{-3}	7.81×10^{-3}	0.125	1.25	4.13	6.25	9.37	12.5	18.75	25	100

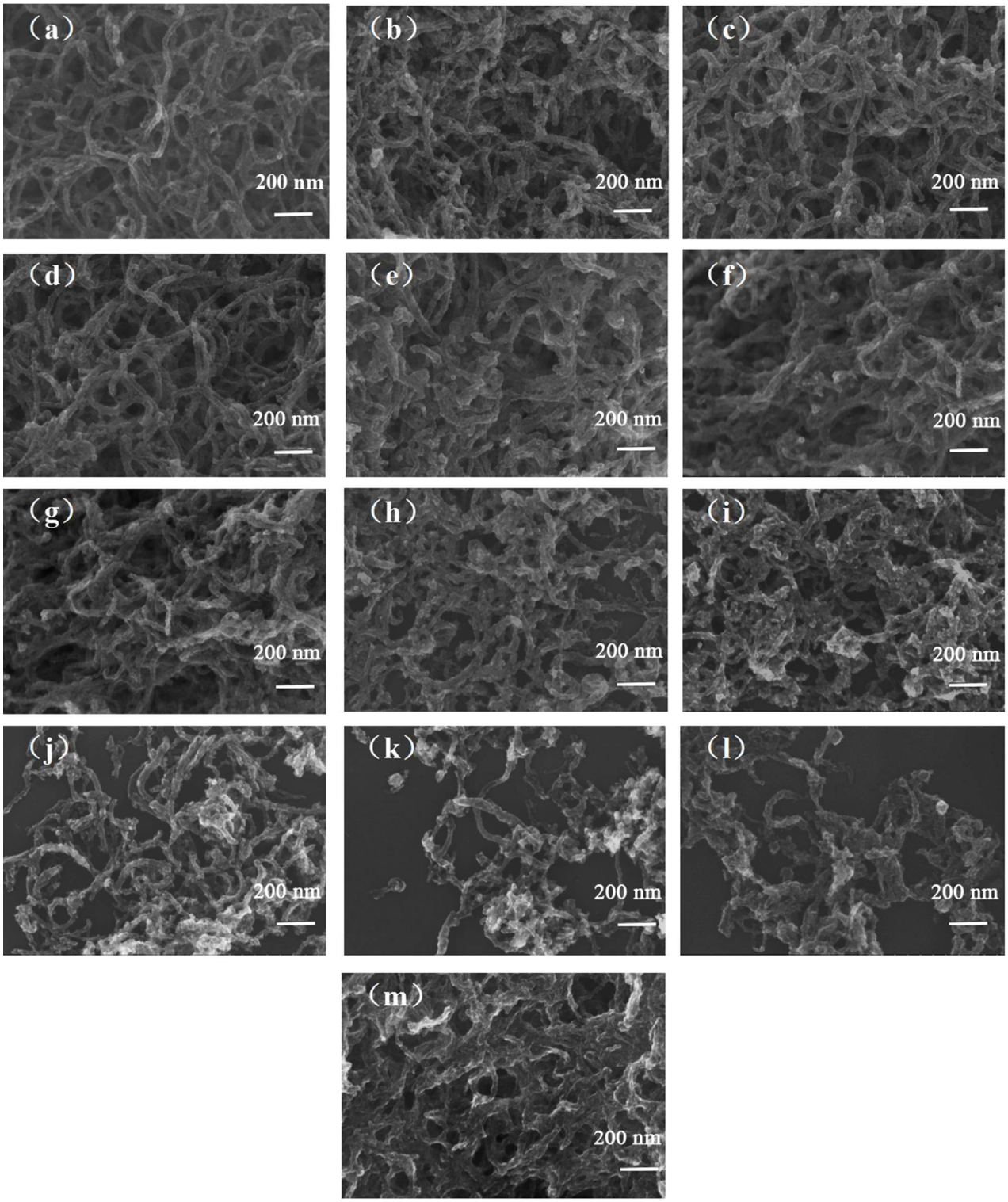

Figure S1. SEM images of (a) CuO_y-CNT-1#, (b-l) CuO_y/SnO_x-CNT-#2-#12, and (m) SnO_x-CNT-#13.

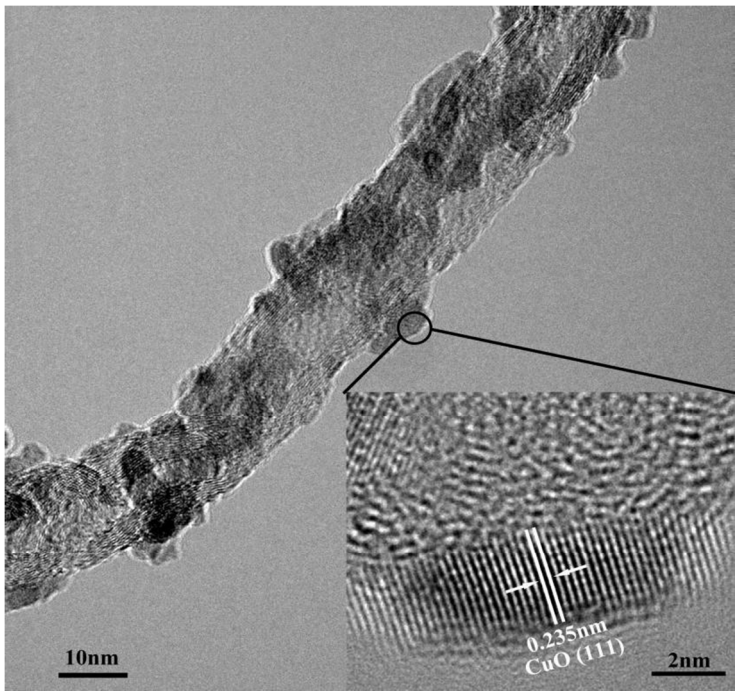

Figure S2. TEM images of CuO_y/SnO_x-CNT-#7.

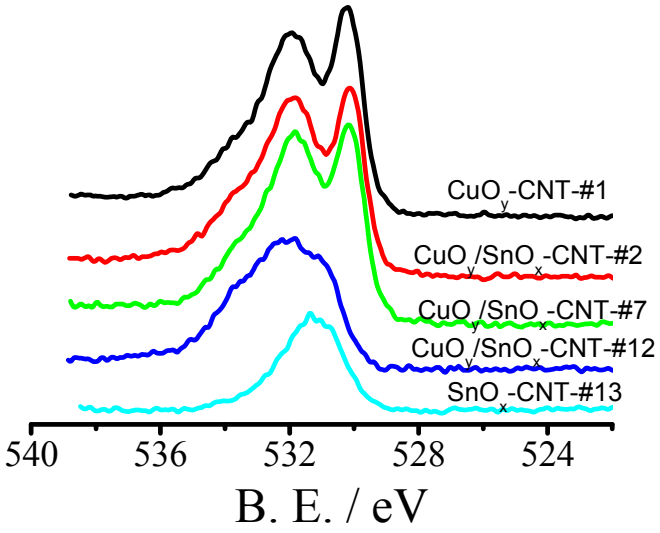

Figure S3. O 1s core level XPS spectra of CuO_y-CNT-#1, CuO_y/SnO_x-CNT-#2, CuO_y/SnO_x-CNT-#7, CuO_y/SnO_x-CNT-#12 and SnO_x-CNT-#13.

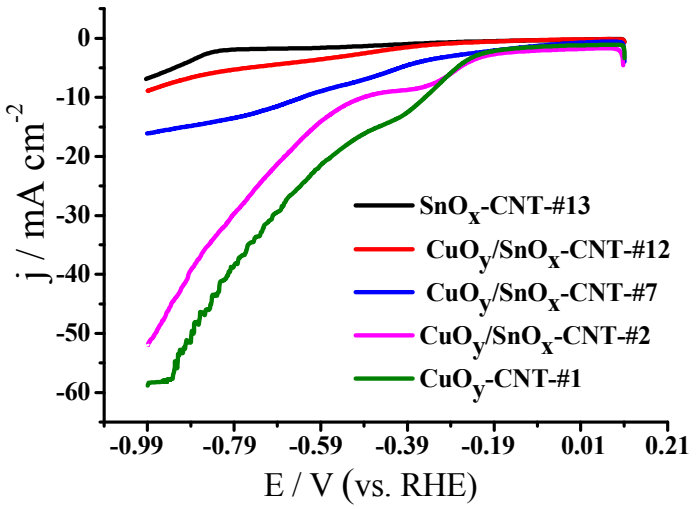

Figure S4. Linear sweep voltammograms of CuO_y-CNT-#1, CuO_y/SnO_x-CNT-#2, CuO_y/SnO_x-CNT-#7, CuO_y/SnO_x-CNT-#12 and SnO_x-CNT-#13 electrocatalysts measured in CO_2-saturated 0.1 M $KHCO_3$ solution at a scan rate of 50 mV/s.

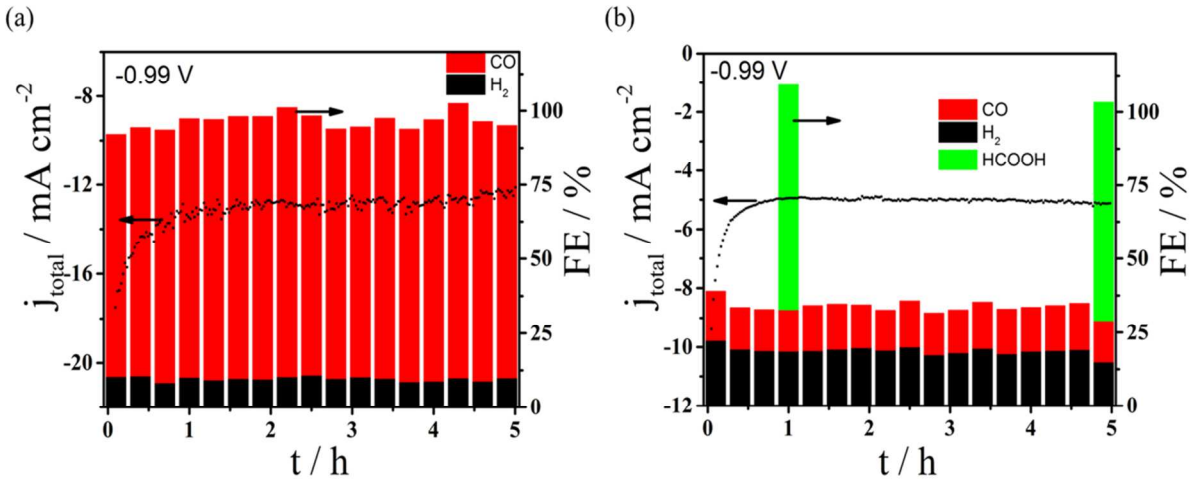

Figure S5. Long term catalytic stability for the (a) CuO_y/SnO_x-CNT-#7 and (b) CuO_y/SnO_x-CNT-#12 electrocatalysts at -0.99 V vs. RHE in 0.1 M $KHCO_3$ solution.

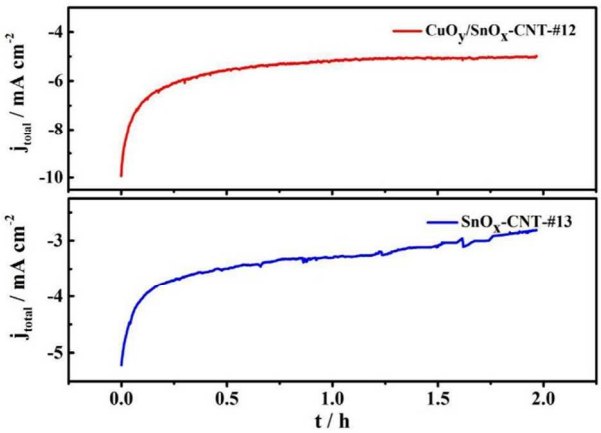

Figure S6. Chronoamperograms for the CuO_y/SnO_x-CNT-#12 and SnO_x-CNT-#13 electrocatalysts at -0.99 V vs. RHE in CO_2-saturated 0.1 M $KHCO_3$ solution.

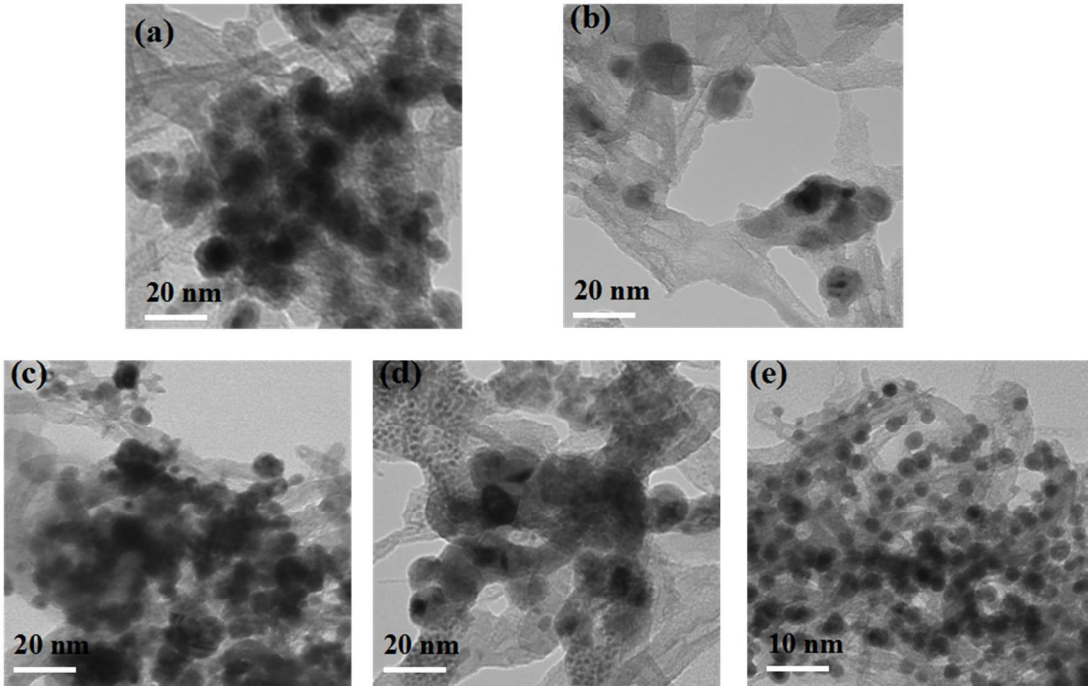

Figure S7. Low-magnification TEM images of (a) CuO_y-CNT-#1, (b) CuO_y/SnO_x-CNT-#2, (c) CuO_y/SnO_x-CNT-#7, (d) CuO_y/SnO_x-CNT-#12, and (e) SnO_x-CNT-#13 after CO_2 electroreduction catalysis.