Supplementary Materials

The Study of Reverse Water Gas Shift Reaction Activity over Different Interfaces: The Design of Cu-Plate ZnO Model Catalysts

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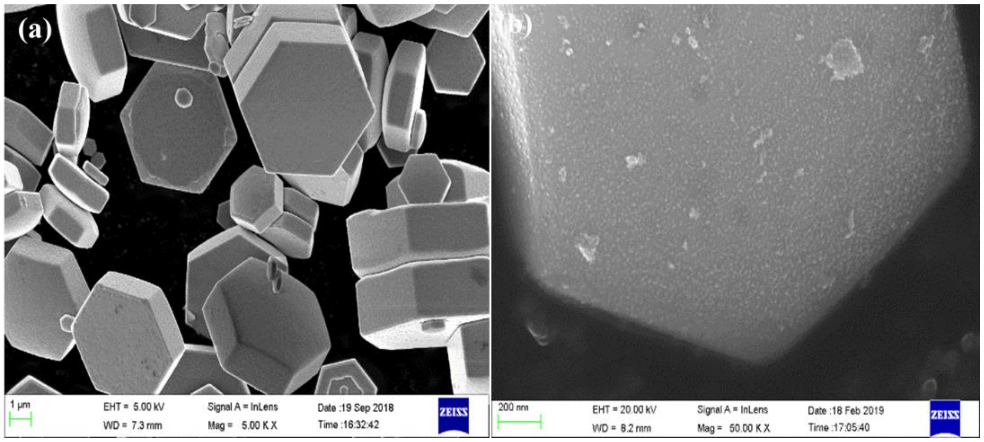

Figure S1. SEM images of pristine plate ZnO (a) and 1Cu/ZnO (b) after reduction

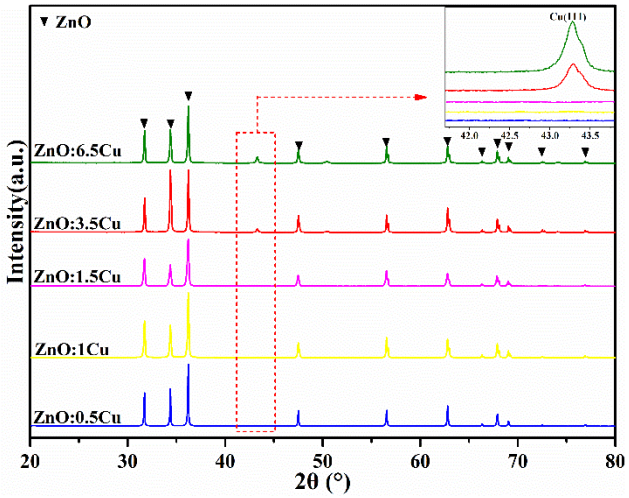

Figure S2. XRD patterns of ZnO:XCu model catalysts after H_2 reduction, X = 0.5, 1.0, 1.5, 3.5, 6.5.

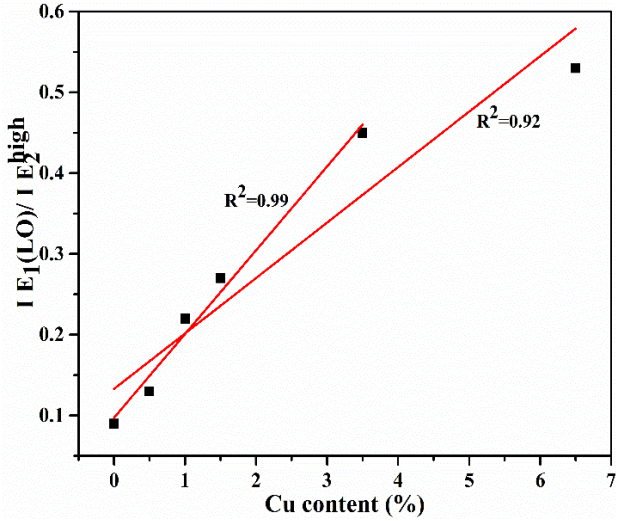

Figure S3. The correlation of the intensity ratio of $E_1(LO)$ to E_2^{high} and the Cu content.

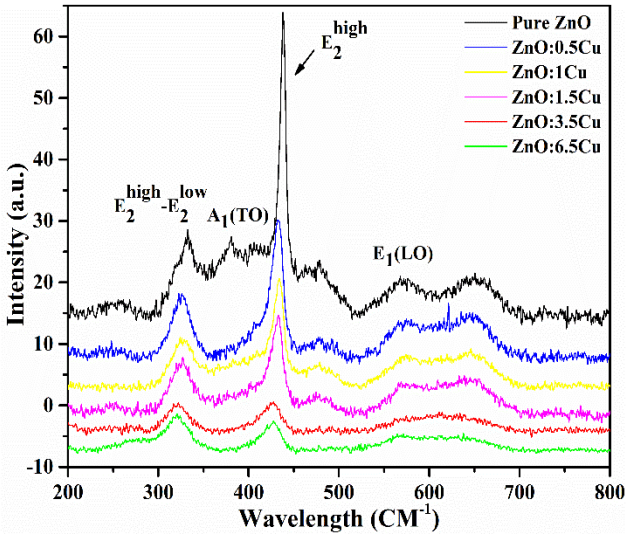

Figure S4. Raman spectra of the reduced pristine ZnO and ZnO:XCu model catalysts, X = 0.5, 1, 1.5, 3.5, 6.5.

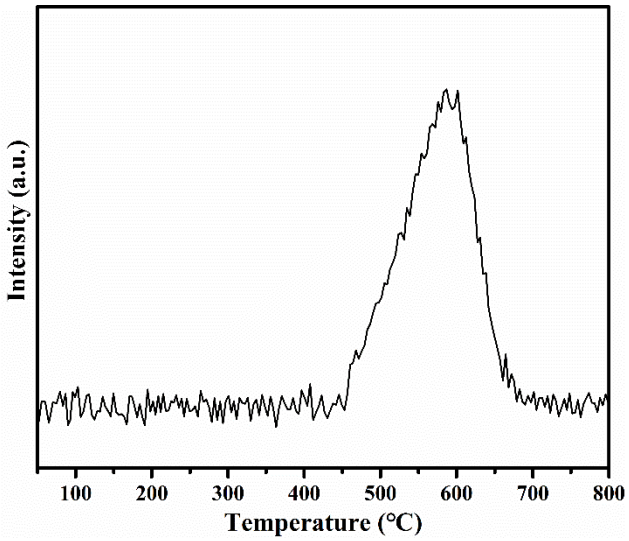

Figure S5. H_2-TPD profile of pristine ZnO plate after reduction in H_2 without H_2 adsorption (detected by MS).

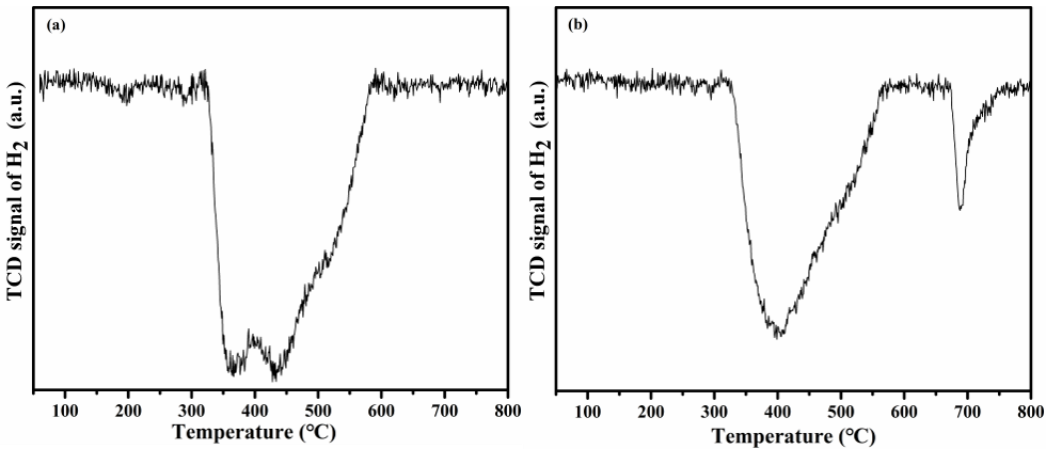

Figure S6. H_2-TPD profile of plate ZnO:1Cu model catalyst after reduction in H_2 without H_2 adsorption (a) and with H_2 adsorption (b), detected by TCD detector.

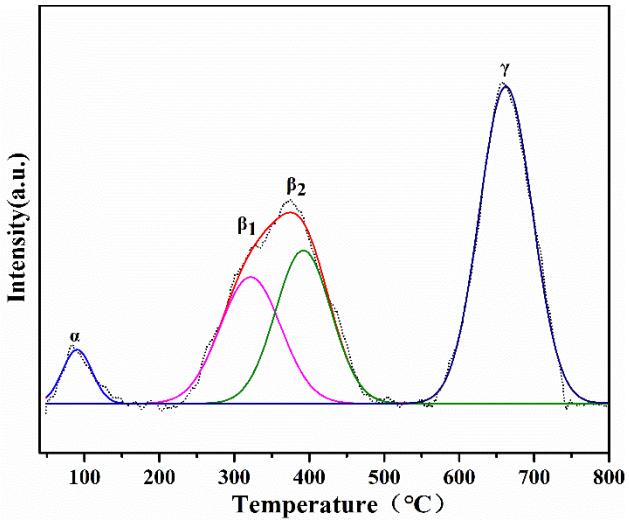

Figure S7. CO_2-TPD profiles of the 1Cu/ZnO model catalyst.

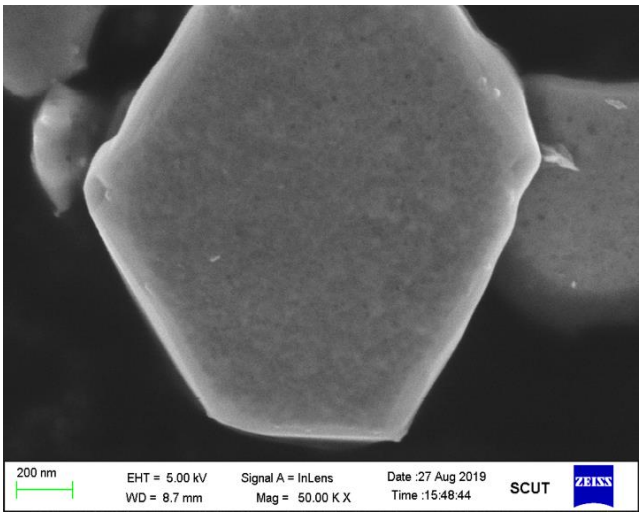

Figure S8. SEM image of ZnO:1Cu model catalyst after RWGS stability evaluation.

Table S1. The intensity ratios of $E_1(LO)$ to E_2^{high} and wavenumber of E_2^{high} for the reduced pristine ZnO and ZnO:XCumodel catalysts.

Samples	ZnO	ZnO:0.5Cu	ZnO:1Cu	ZnO:1.5Cu	ZnO:3.5Cu	ZnO:6.5Cu
$E_1(LO)/E_2^{high}$	0.12	0.25	0.29	0.31	0.48	0.54

Table S2. Specific surface area of calcined ZnO andCu-ZnO model catalysts.

Samples	ZnO[b]	ZnO:0.5Cu	ZnO:1Cu	ZnO:1.5Cu	ZnO:3.5Cu	ZnO:6.5Cu	1Cu/ZnO
S_{BET} (m^2/g)[a]	2.93	3.86	4.29	4.42	3.90	4.29	4.94

[a] determined by N_2 adorption-desorption isotherm.

[b] used for R_{SSA} calculation of 1Cu/ZnO model catalyst.

Table S3. Surface compositional analysis of ZnO:1Cu model catalyst based on XPS experiments.

Treatment	Surface composition (%)			
	Cu	Zn	O	Cu/Zn[a]
Reduced	2.47	45.71	51.82	5.40
After reaction	2.72	48.61	48.66	5.60

[a] calculated from O1s, $Zn2p_{3/2}$ and $Cu2p_{3/2}$.