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Supplementary Materials: Ru-Pd bimetallic catalysts supported on CeO_2-MnO_X oxides as efficient systems for H_2 purification through CO preferential oxidation

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2.2. Catalysts Characterization

2.2.1. Temperature Programmed Reduction (H_2-TPR)

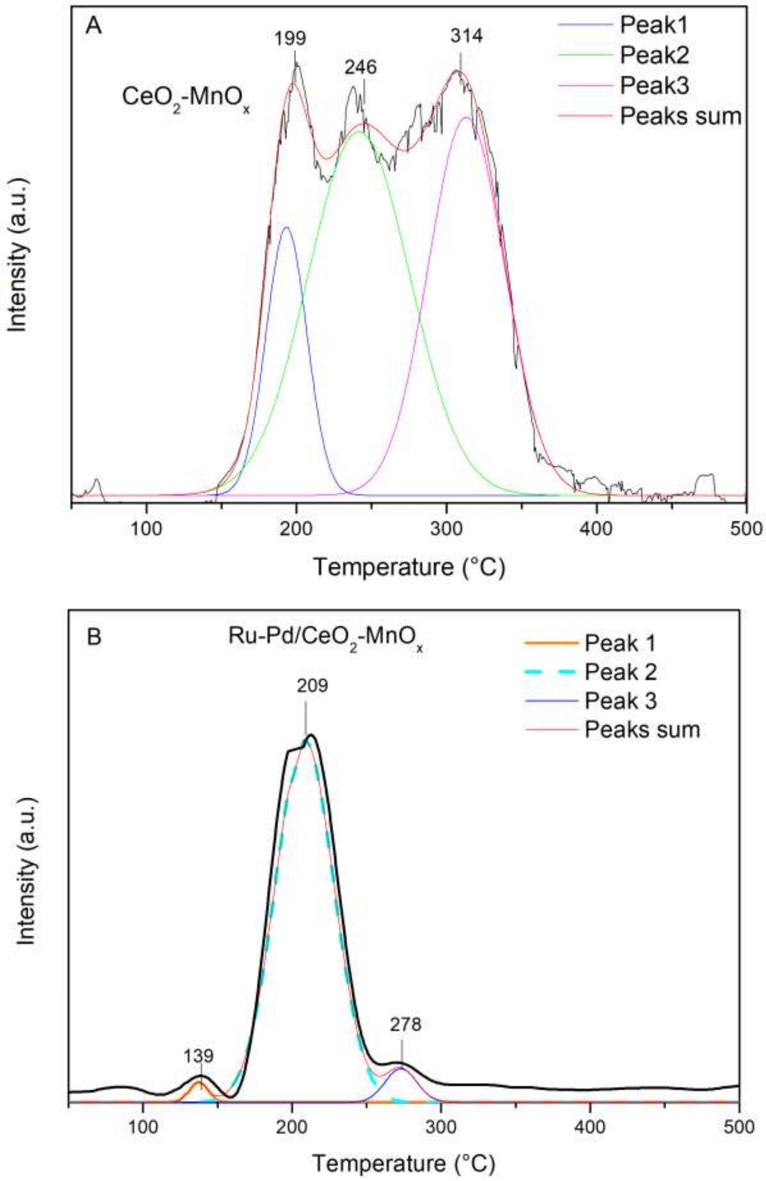

Figure S1. H_2-TPR profiles with peaks deconvolution for Ru/CeO_2-MnO_x (A) and Ru-Pd/CeO_2-MnO_x (B) samples.

Table S1. H_2-TPR quantification for the investigated catalysts

Catalysts	LT peak (°C)	H_2 uptake (μmol/g_{cat})	MT peak (°C)	H_2 uptake (μmol/g_{cat})	HT peak (°C)	H_2 uptake (μmol/g_{cat})
CeO_2	-	-	-	-	500	161
Ru/CeO_2	164	396	190	544	325	210
CeO_2-MnO_x	-	-	-	-	435	295
Ru/CeO_2-$MnOx_x$	199	381	246	644	314	221
Pd/CeO_2-MnO_x	-	-	275	821	-	-
Ru-Pd/CeO_2-MnO_x	139	80	209	1963	278	62

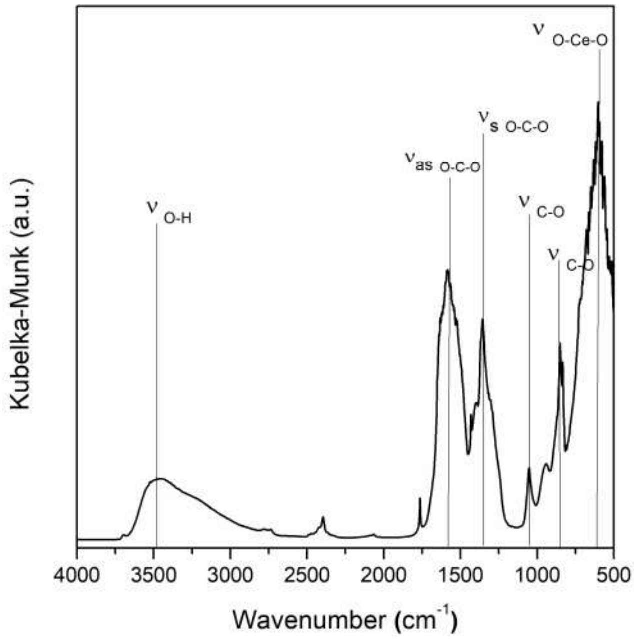

Figure S2. Drift spectra of bare CeO_2.

2.2.3. XPS Measurements

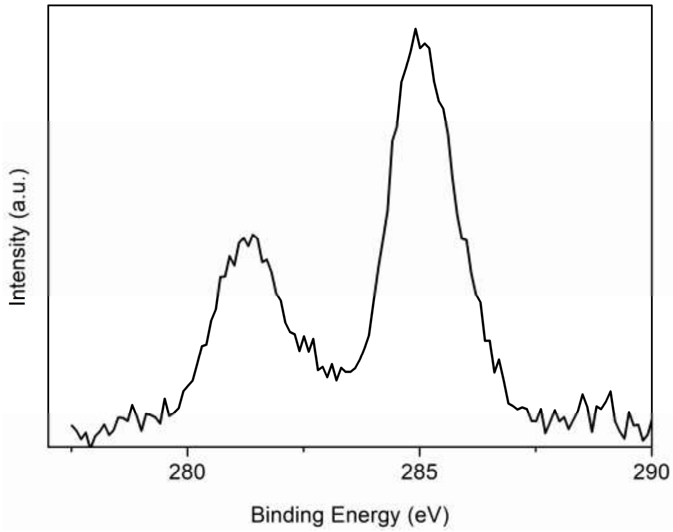

Figure S3. Al Kα excited XPS of the 1%Ru/CeO_2 in the Ru 3d – C 1s energy region. The peak at 281.3 eV is due to the Ru $3d_{5/2}$ state, the peak at 285.0 eV is due both to the adventious carbon and Ru $3d_{3/2}$ state.

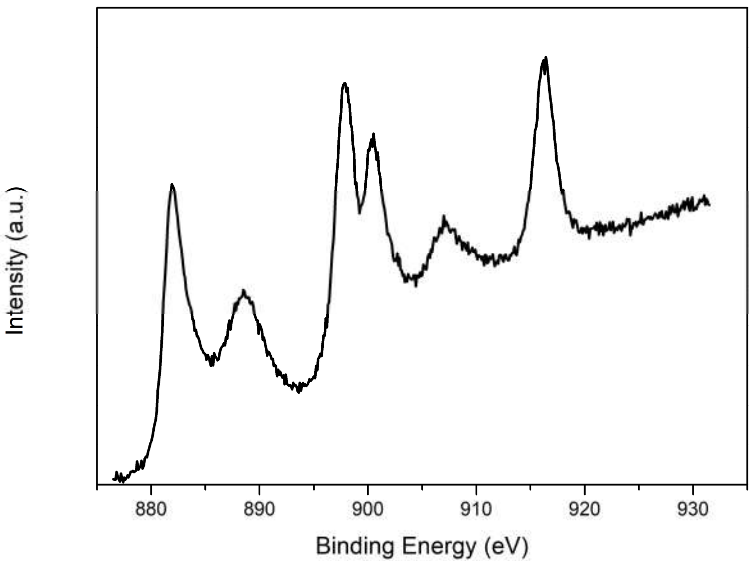

Figure S4. Al Kα excited XPS of the Ru/CeO_2 in the Ce 3d energy region.

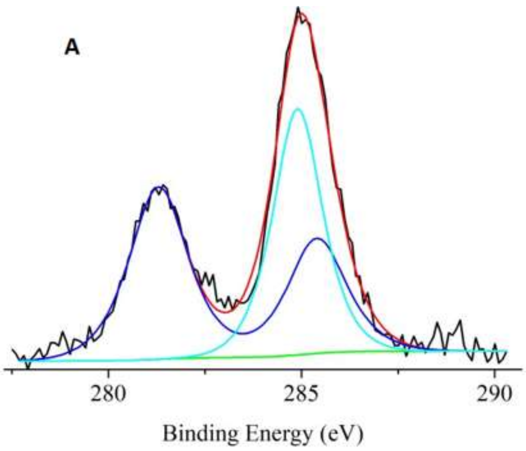

Figure S5A. Al Kα excited XPS of the Ru/CeO_2 in the Ru 3d – C 1s energy region; the black line refers to the experimental profile; the green line refers to the background; the peaks at 281.3 and 285.4 eV (blue line) represent the Ru $3d_{5/2,3/2}$ spin-orbit components, the peak at 285.0 eV (cyan line) refers to the adventitious carbon; the red line, superimposed to the experimental profile, refers to the sum of the Gaussian components.

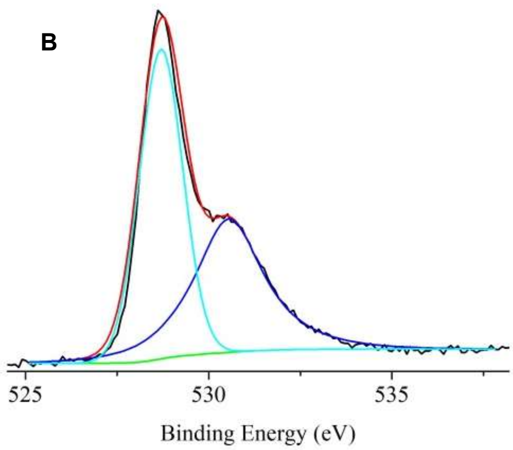

Figure S5B. Al Kα excited XPS of the Ru/CeO_2 in the O 1s energy region. The black line refers to the experimental profile; the green line refers to the background; the cyan line refers to the 528.7 eV peak; the blue line refers to the 530.6 eV peak; the red line, superimposed to the experimental profile, refers to the sum of the Gaussian components.

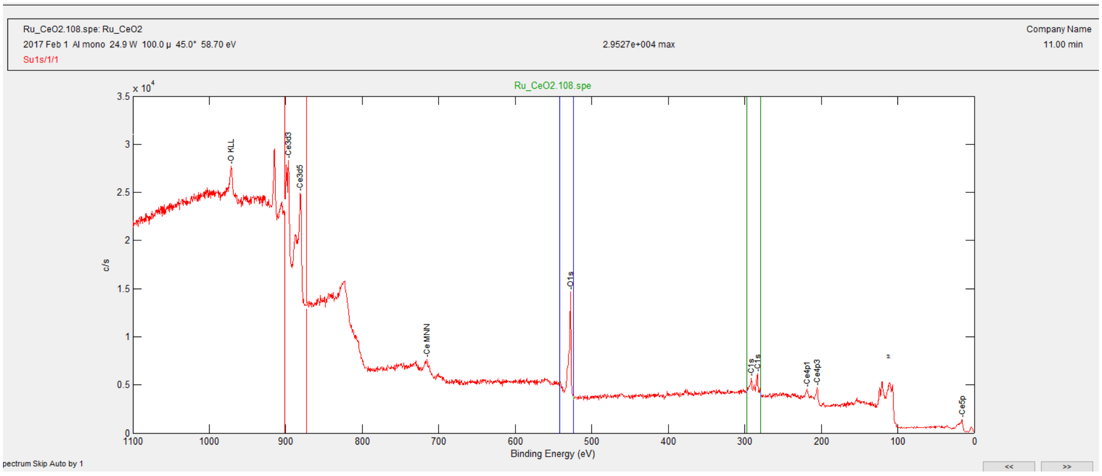

Figure S6. XPS survey spectrum of Ru/CeO_2.