

PdZn catalysts for CO₂ hydrogenation to methanol using chemical vapour impregnation (CVI)

H. Bahruji,^a M. Bowker,^{a,b*} W. Jones^b, J. Hayward,^a J. Ruiz Esquiús,^a D. J. Morgan^a and G. J. Hutchings^a

Supplementary information

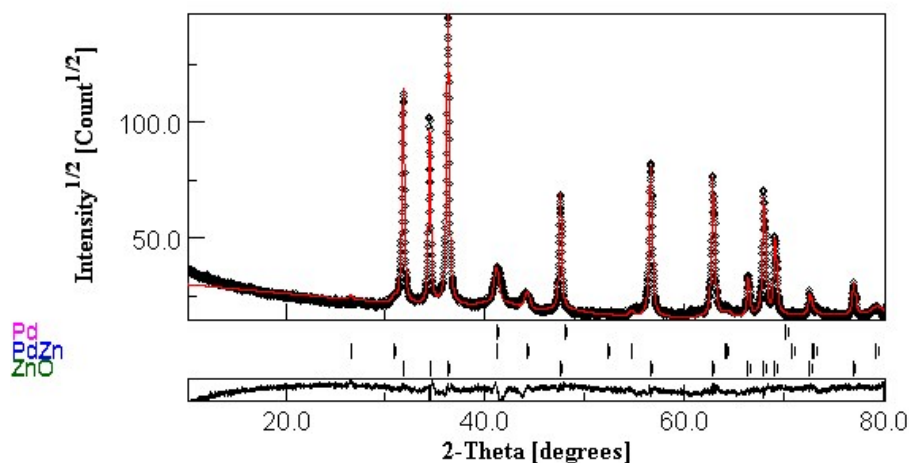


Fig S1. XRD diffractogram of 5% Pd/ZnO analysed using Maud analysis software. The components are PdZn, Pd, and ZnO.

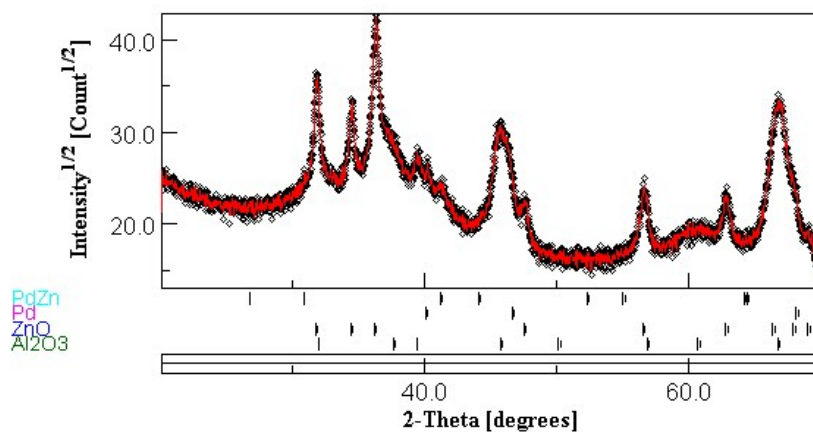


Fig S2: XRD diffractogram of 5% Pd:Zn (1:10) /Al₂O₃ analysed using Maud analysis software. The components are PdZn, Pd, Al₂O₃ and ZnO.

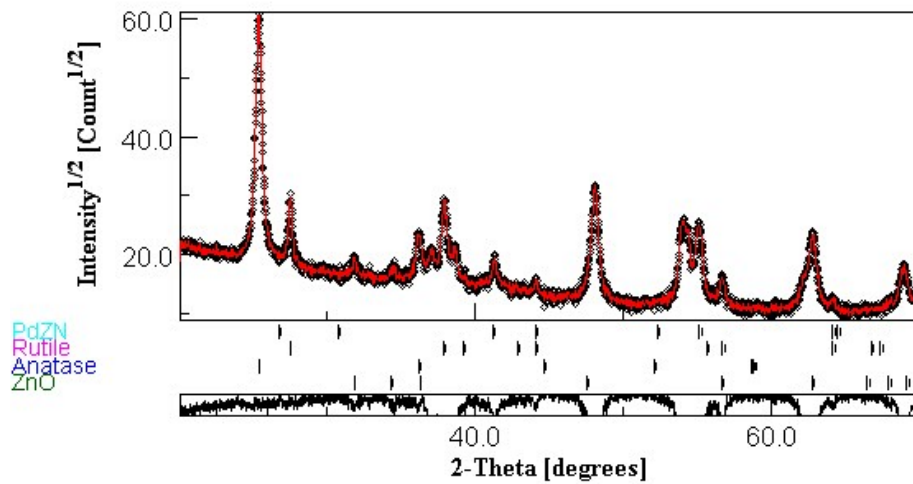


Fig S3: MAUD analysis of 5% Pd:Zn (1:10) /TiO₂ analysed using Maud analysis software. The components are PdZn, rutile, anatase and ZnO.

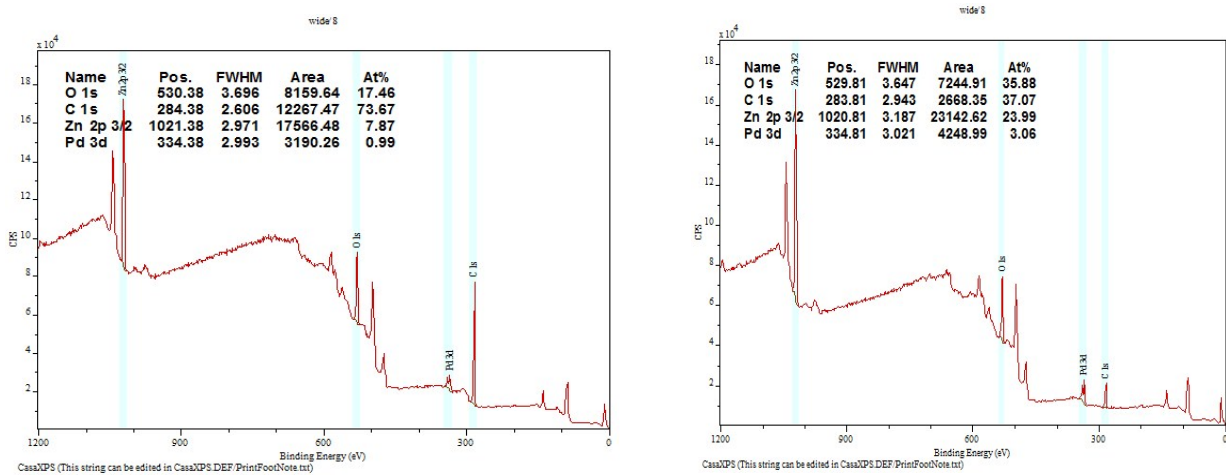


Fig S4: XPS wide survey of (left) 5% Pd/ZnO that was only reduced in H₂ at 400°C, and (right) 5% Pd/ZnO that was calcined in air at 500°C followed by reduction in H₂ at 400°C.

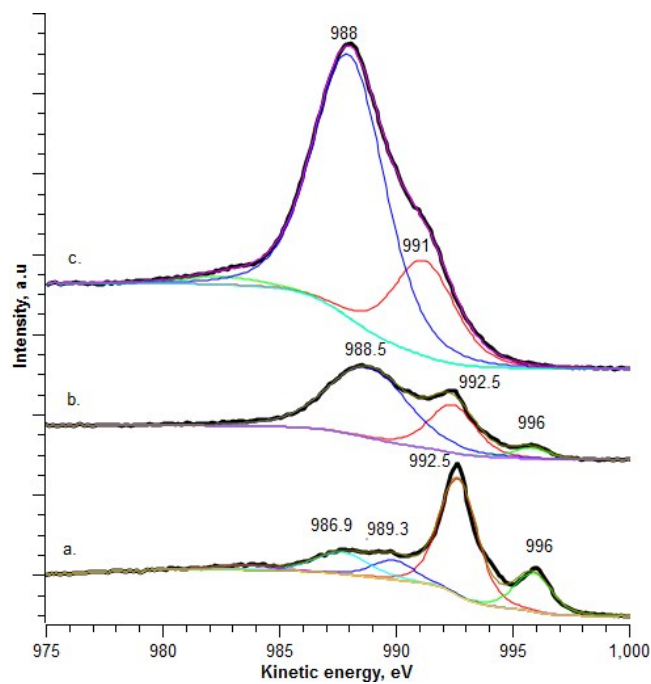


Fig. S5. XPS Zn LMM Auger electron spectra of a) Zn metal, b) partially oxidised Zn metal and c) ZnO

Table S1. XPS data for Pd 3d of 5% Pd:Zn (1:1)/TiO₂, 5% Pd:Zn (1:2)/TiO₂, 5% Pd:Zn (1:5)/TiO₂, 5% Pd:Zn (1:10)/TiO₂ and 5% Pd:Zn (1:10)/Al₂O₃

	Pd 3d, eV	
	Pd ⁰	PdZn
5 % Pd:Zn (1:1)/TiO ₂	334.9	335.8
5 % Pd:Zn (1:2)/TiO ₂	335.0	335.9
5 % Pd:Zn (1:5)/TiO ₂	335.2	336.2
5 % Pd:Zn (1:10)/TiO ₂	335.3	336.2
5% Pd:Zn (1:10)/Al ₂ O ₃	335.3	336.3