

## Supplementary Information

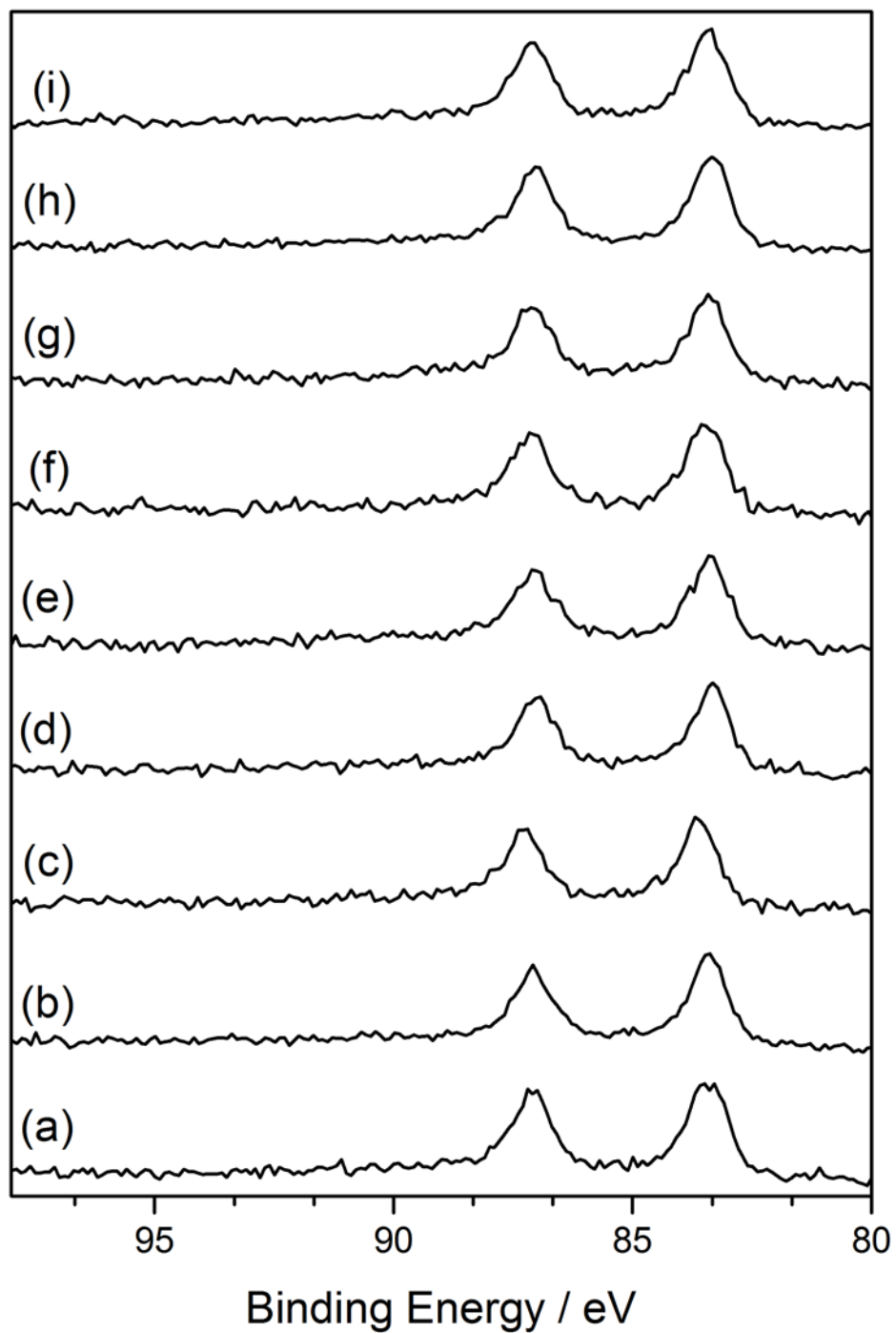
### **The use of carbon monoxide as a probe molecule in spectroscopic studies for determination of exposed gold sites on TiO<sub>2</sub>**

Giacomo M. Lari,<sup>a,b</sup> Ewa Nowicka,<sup>a</sup> David J. Morgan,<sup>a</sup> Simon A. Kondrat<sup>a</sup> and Graham J. Hutchings<sup>a\*</sup>

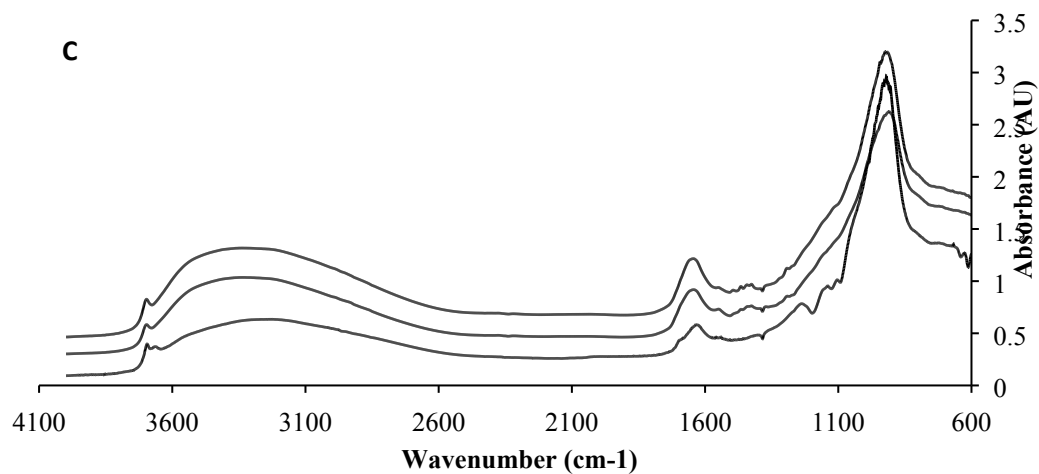
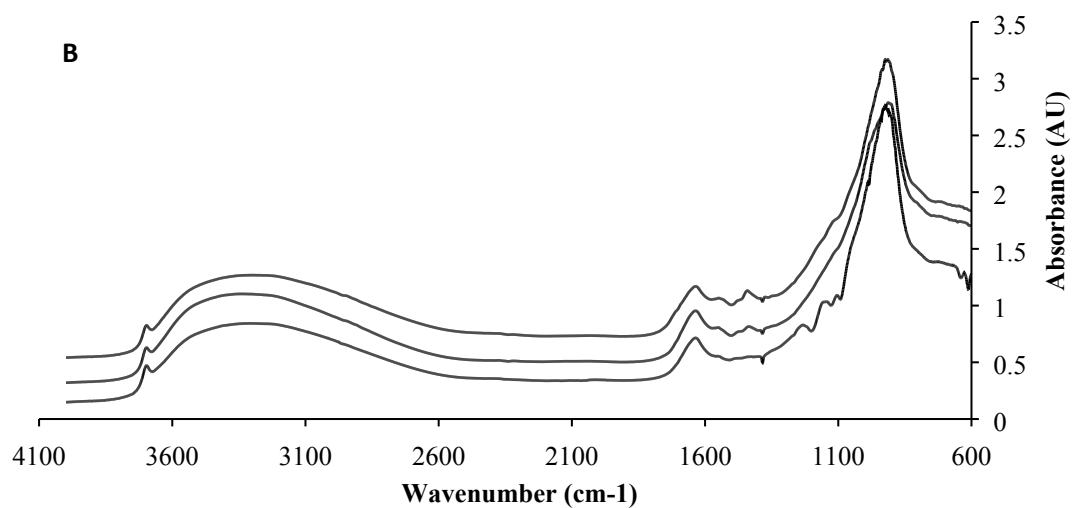
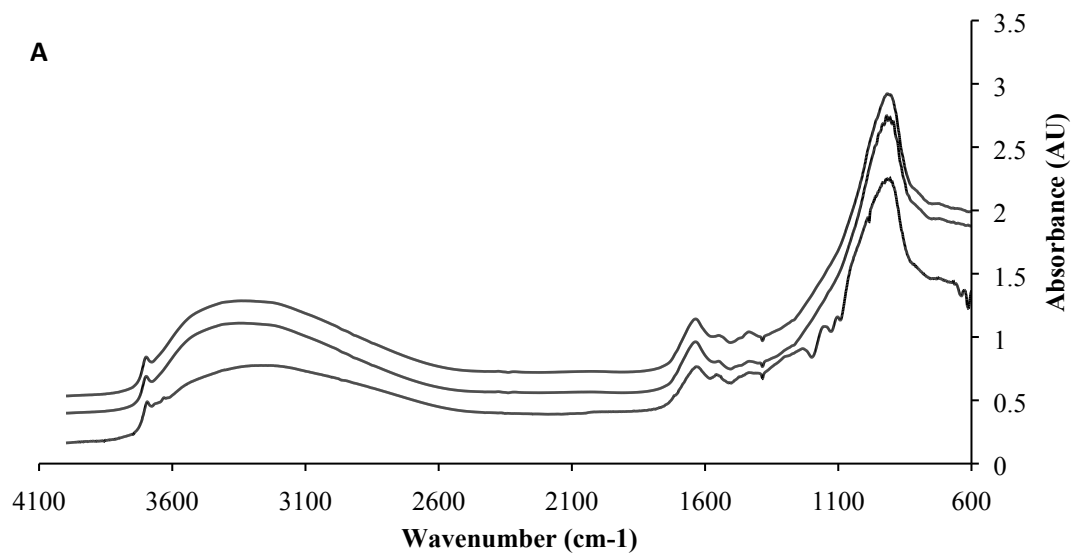
<sup>a</sup> *Cardiff Catalysis Institute, School of Chemistry, Cardiff University, Main Building, Park Place, Cardiff, CF10 3AT, UK.*

<sup>b</sup> *Current address: Institute for Chemical and Bioengineering, ETH Zurich, Vladimir-Prelog-Weg 1, CH-8093 Zurich, Switzerland.*

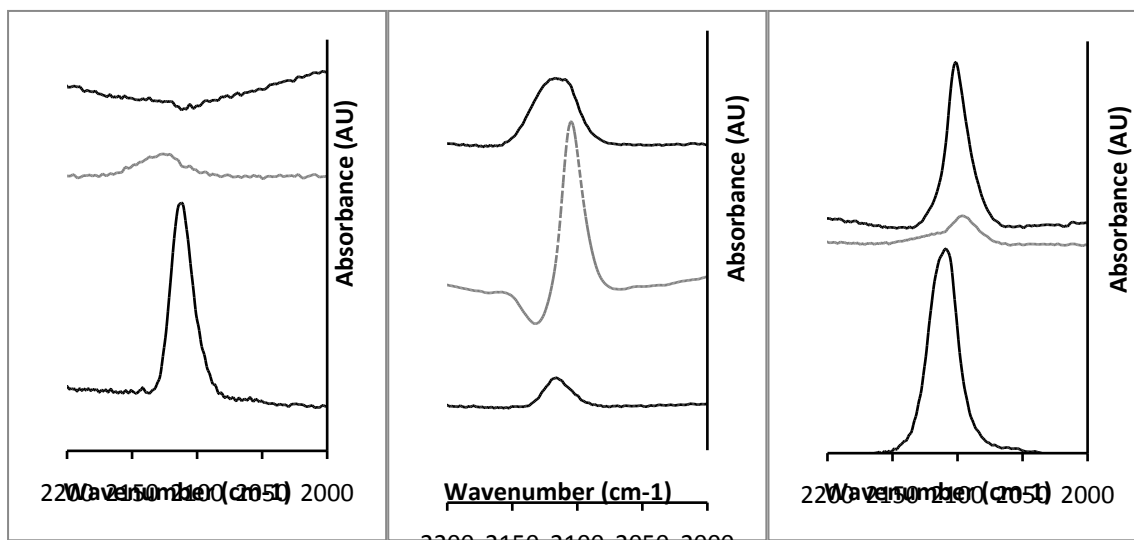
**Figure 1:** Au(4f) core-level spectra of Au/TiO<sub>2</sub> catalysts. (a) SI-PVA Fresh, (b) SI-PVA Reflux, (c) SI-PVA Calcined, (d) SI-PVP Fresh, (e) SI-PVP Reflux, (f) SI-PVP Calcined, (g) DP Fresh, (h) DP Reflux, (i) DP Calcined.



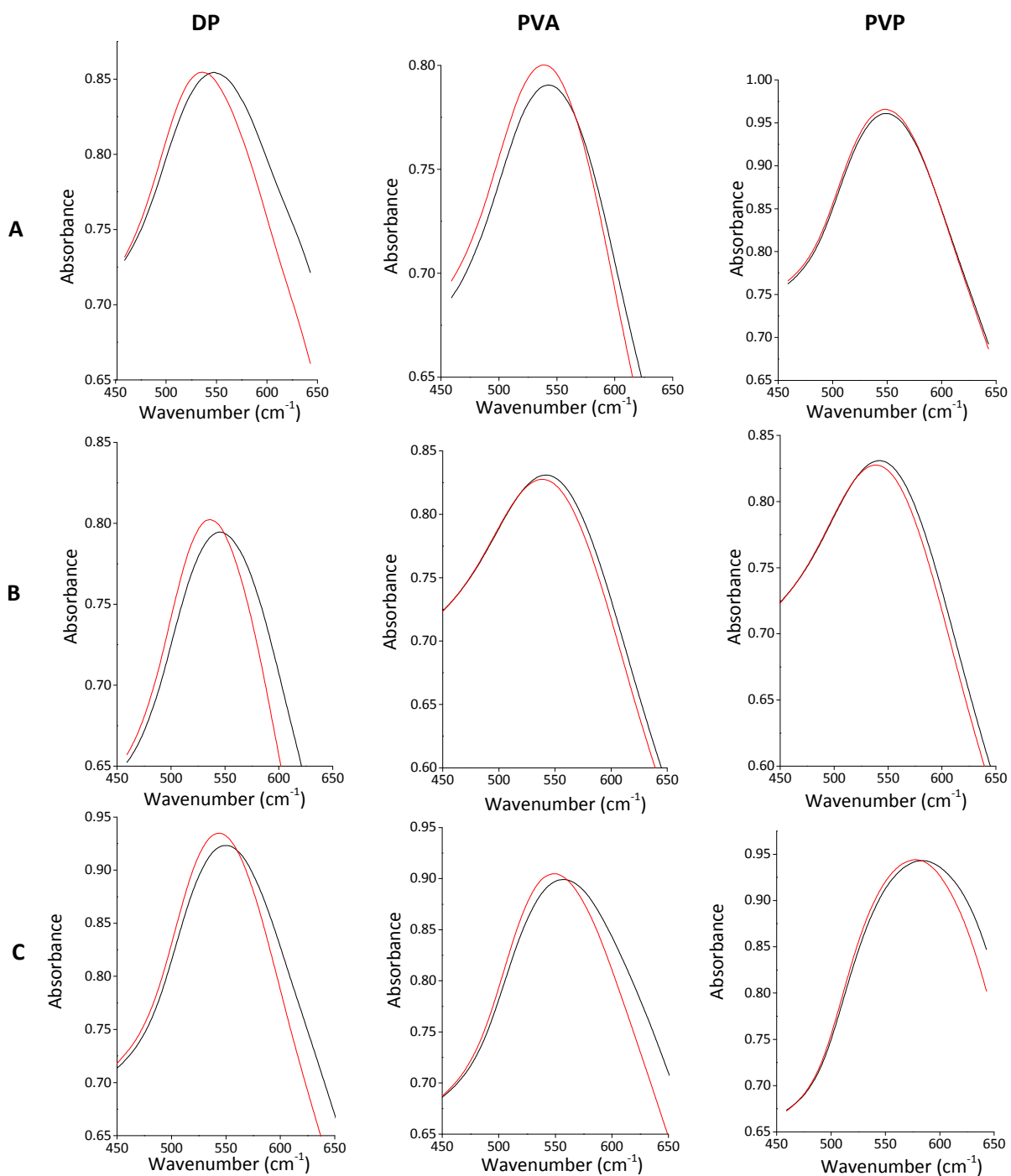
**Figure 2.** DRIFT spectra of 1%Au/TiO<sub>2</sub> prepared by DP (a), SI-PVA (b) and SI-PVP (c), fresh catalyst: top line, refluxed for 2 hrs: middle line, calcined: bottom line



**Figure 3.** DRIFTS of CO adsorbed on SI-PVP (a), SI-PVA (b) and DP (c) 1 wt.% Au/TiO<sub>2</sub> catalysts before treatment (top: black line), after 2h reflux (middle: dotted line) and after calcination (bottom: dashed line).



**Figure 4:** UV-Vis analysis of catalysts prepared by DP, SI-PVA and SI-PVP in N<sub>2</sub> (black) and 0.5% CO/N<sub>2</sub> (red) environment: 1 wt.% Au/TiO<sub>2</sub> catalysts before treatment (a), after 2 h reflux (b) and calcination at 500°C (c)



**Figure 5:** Particle size distribution histograms of catalysts prepared by DP, SI-PVA and SI-PVP : 1 wt.% Au/TiO<sub>2</sub> catalysts before treatment (a), after 2 h reflux (b) and calcination at 500°C (c)

