

## Supporting Information

### ***In situ* Spectroscopic Investigation of Oxidative Dehydrogenation and Disproportionation of Benzyl Alcohol over Supported Gold-Palladium Nanoparticles**

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Weckhuysen<sup>[b]</sup> and Graham J. Hutchings<sup>[a]\*</sup>

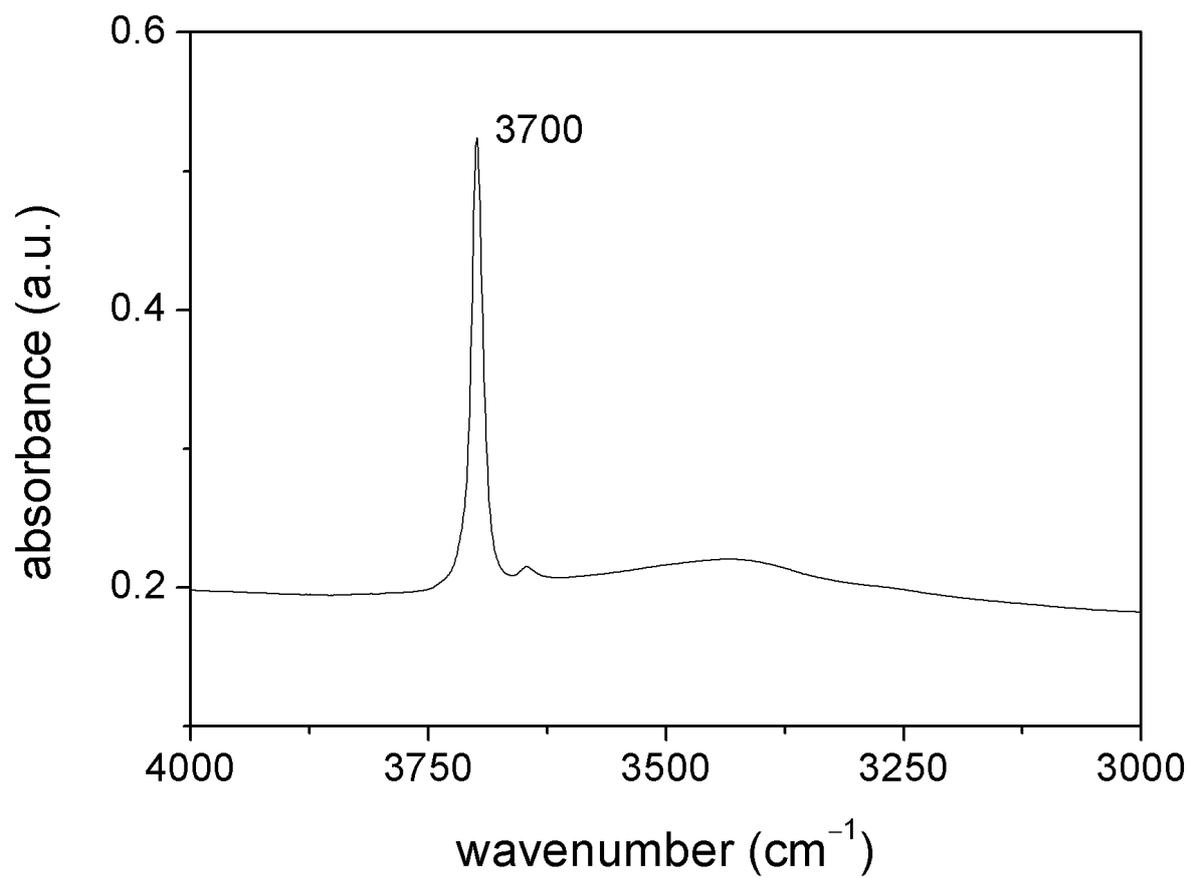


Figure S1. FT-IR spectra of fresh 1% AuPd/MgO catalyst (KBr pellet).

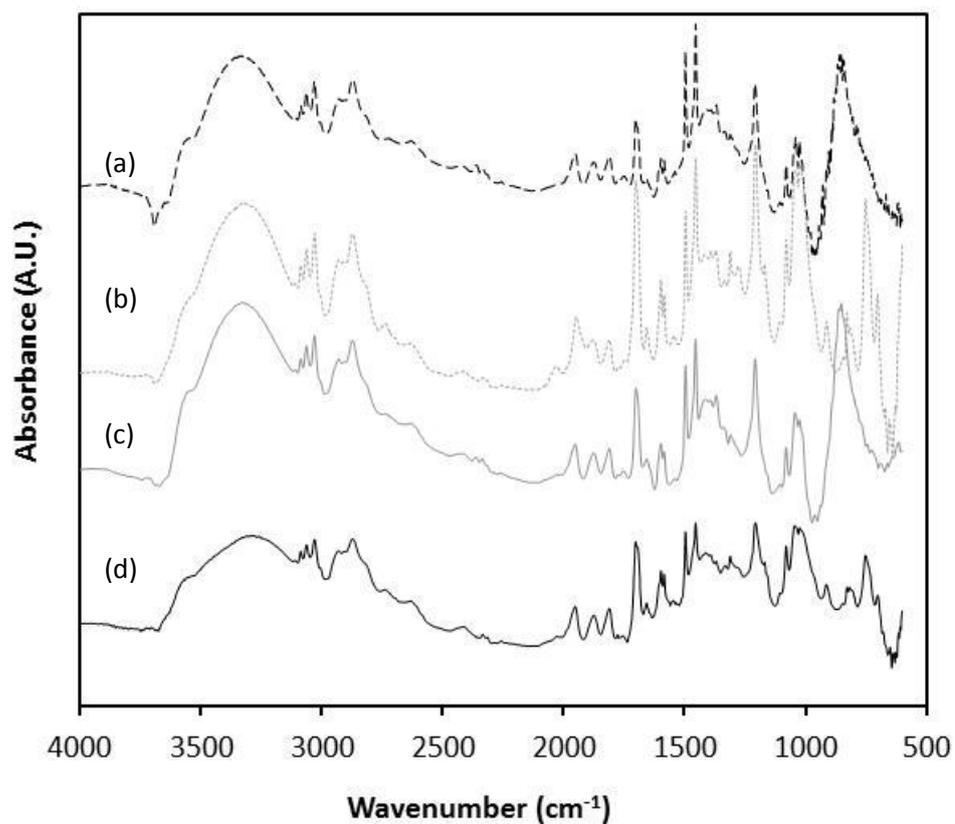


Figure S2. DRIFT spectra recorded at 25 °C for (a) 1% AuPd/TiO<sub>2</sub> under anaerobic condition, (b) 1% AuPd/ZnO under anaerobic condition, (c) 1% AuPd/TiO<sub>2</sub> under aerobic condition and (d) 1% AuPd/ZnO under aerobic condition.

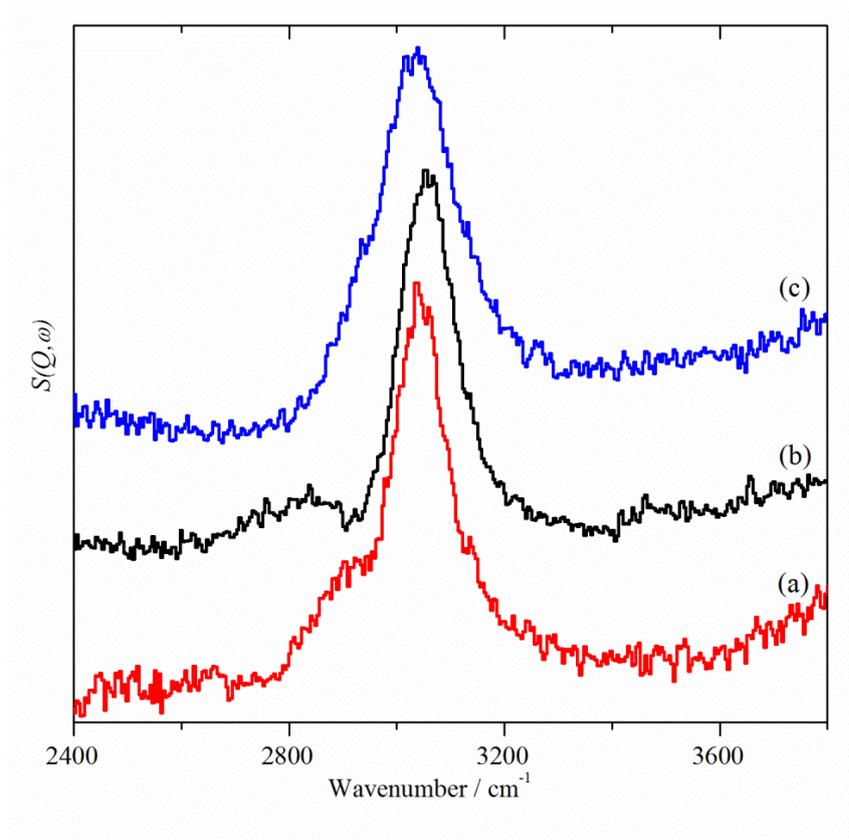


Figure S3. INS spectra in the C–H stretch region of the reference compounds: (a) benzyl alcohol, (b) benzaldehyde and (c) toluene.

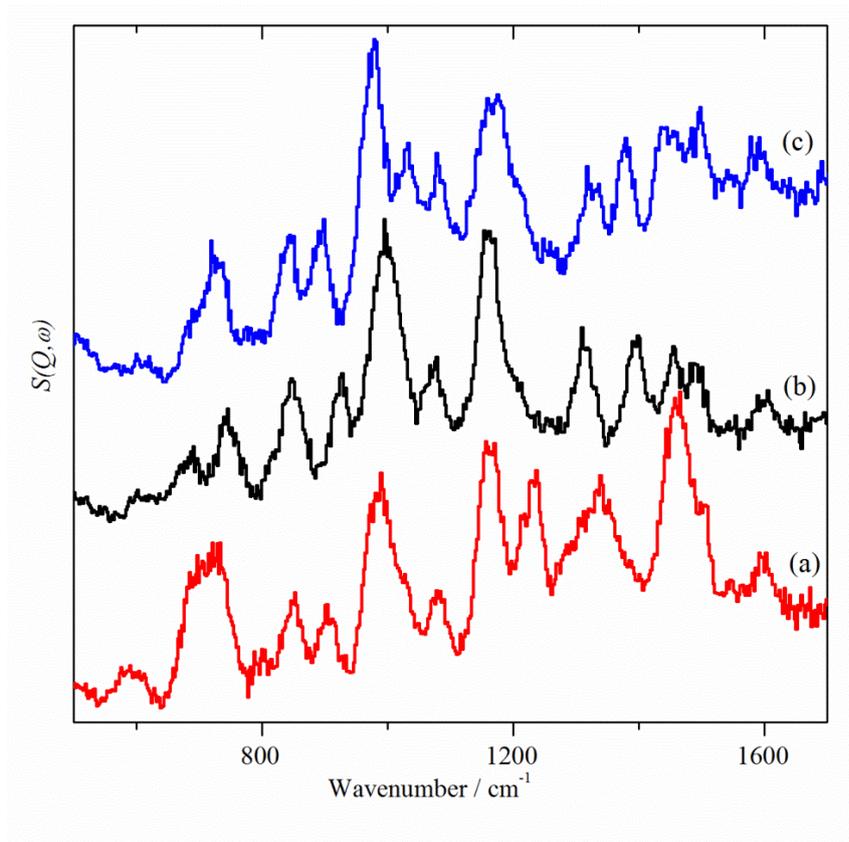


Figure S4. INS spectra in the fingerprint region of the reference compounds: (a) benzyl alcohol, (b) benzaldehyde and (c) toluene.

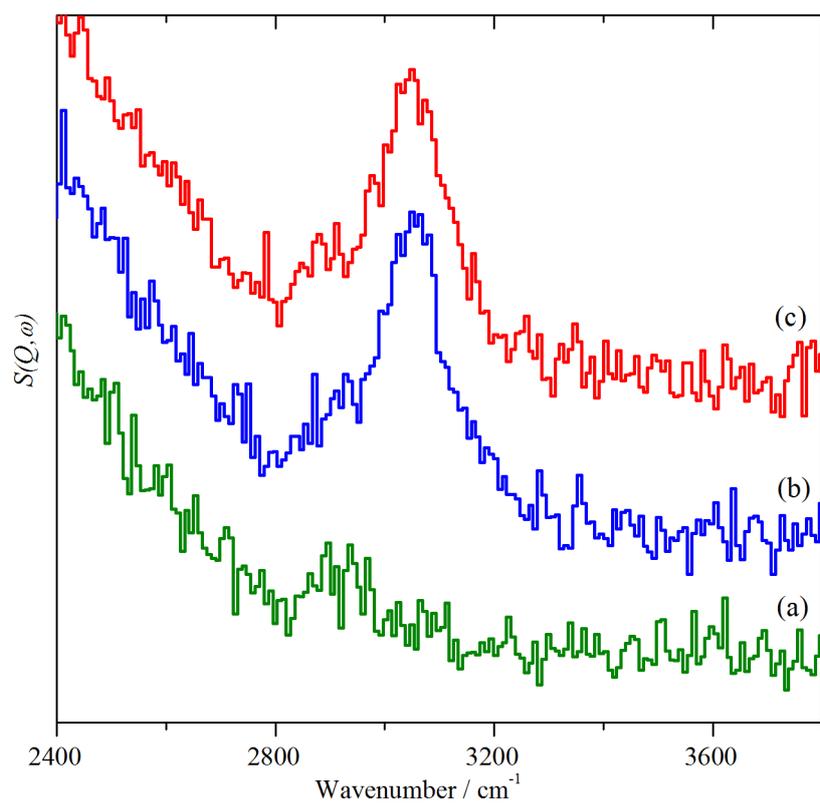


Figure S5. INS spectra in the C–H stretch region. (a) Clean 1% AuPd/TiO<sub>2</sub> catalyst after 20 h helium purge at 150 °C, (b) Catalyst after dosing with benzyl alcohol and (c) after reaction with O<sub>2</sub>.

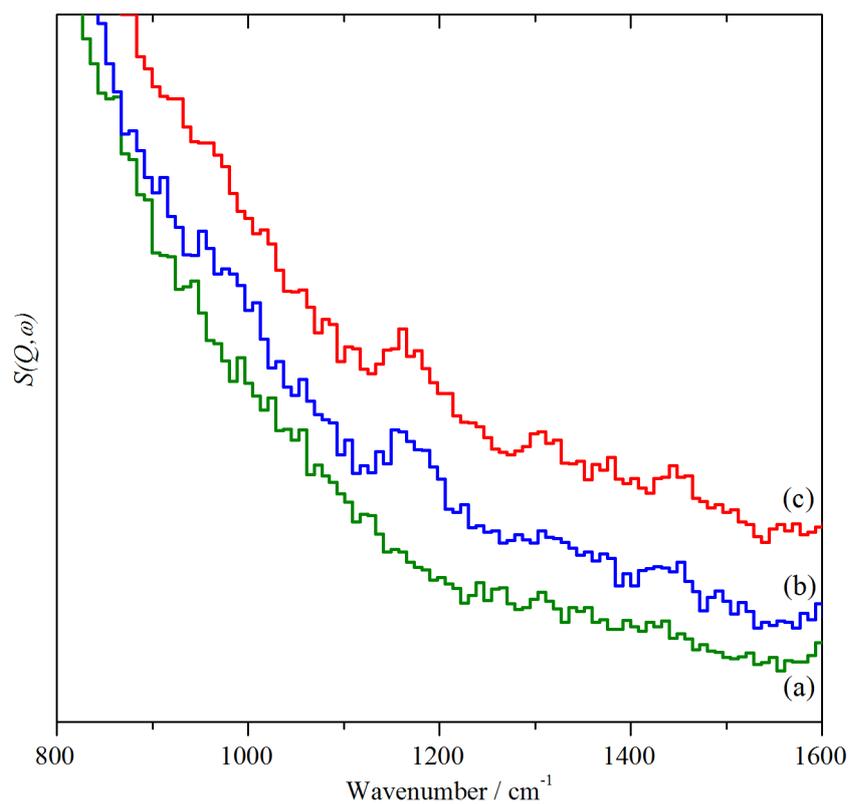


Figure S6. INS spectra in the fingerprint region. (a) Clean 1% AuPd/TiO<sub>2</sub> catalyst after 20 h helium purge at 150 °C, (b) Catalyst after dosing with benzyl alcohol and (c) after reaction with O<sub>2</sub>.