

Supporting Information

Advances in the Sol-immobilisation Preparation of Supported Metal Nanoparticles with Tailored Catalytic Properties: Applications for the Hydrogenation of Nitrophenols.

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Table S1. MP-AES results of the sol-immobilised prepared 0.2 wt. % Pd/TiO₂ catalysts.

The metal loadings for the 1 wt. % Pd/TiO₂ catalysts was 0.72 wt. % Pd, with this value taken from the previous work.

	Concentrations (ppm) at different Pd wavelengths (nm) 1 st repetition		Concentrations (ppm) at different Pd wavelengths (nm) 2 nd repetition		Average Pd wt. %
	Pd 340.5	Pd 361.0	Pd 340.5	Pd 361.0	
0.2 PdA1	1.45	1.46	1.45	1.40	0.14
0.2 PdA2	1.80	1.79	1.73	1.75	0.18
0.2 PdA3	1.47	1.48	1.49	1.49	0.15
0.2 PdA4	1.65	1.65	1.65	1.66	0.17

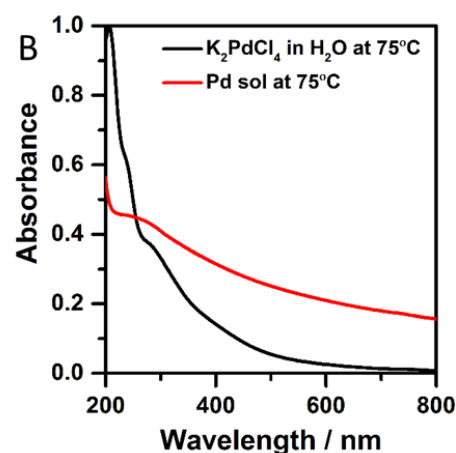
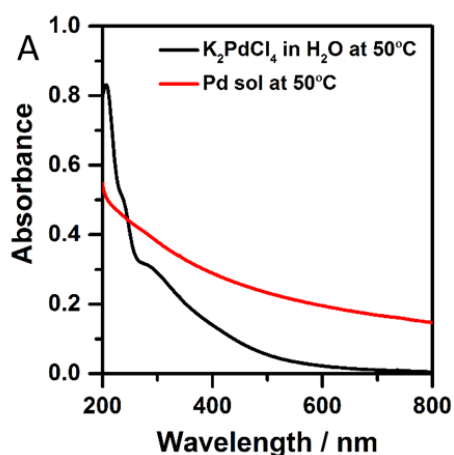


Figure S1. UV-Vis spectra of the K_2PdCl_4 precursor and the subsequent Pd sol generated after reduction of K_2PdCl_4 by $NaBH_4$, in the presence of PVA; A) prepared in a H_2O solvent at $50^\circ C$ and B) prepared in a H_2O solvent at $75^\circ C$.

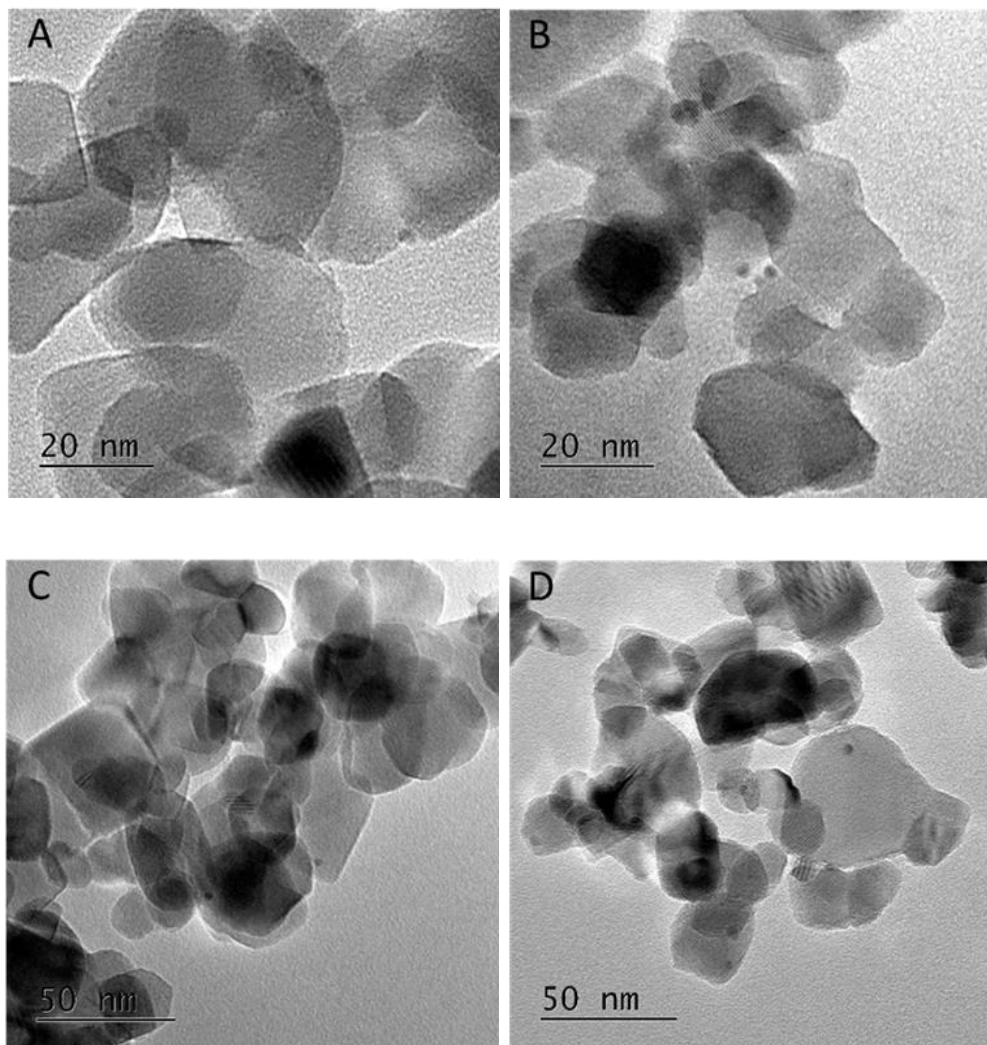


Figure S2. Selected TEM images of 0.2 wt. % Pd/TiO₂ catalysts prepared at different temperatures, in H_2O solvent environment; A) $1^\circ C$ (0.2 PdA1), B) $25^\circ C$ (0.2 PdA2), C) $50^\circ C$ (0.2 PdA3) and D) $75^\circ C$ (0.2 PdA4).

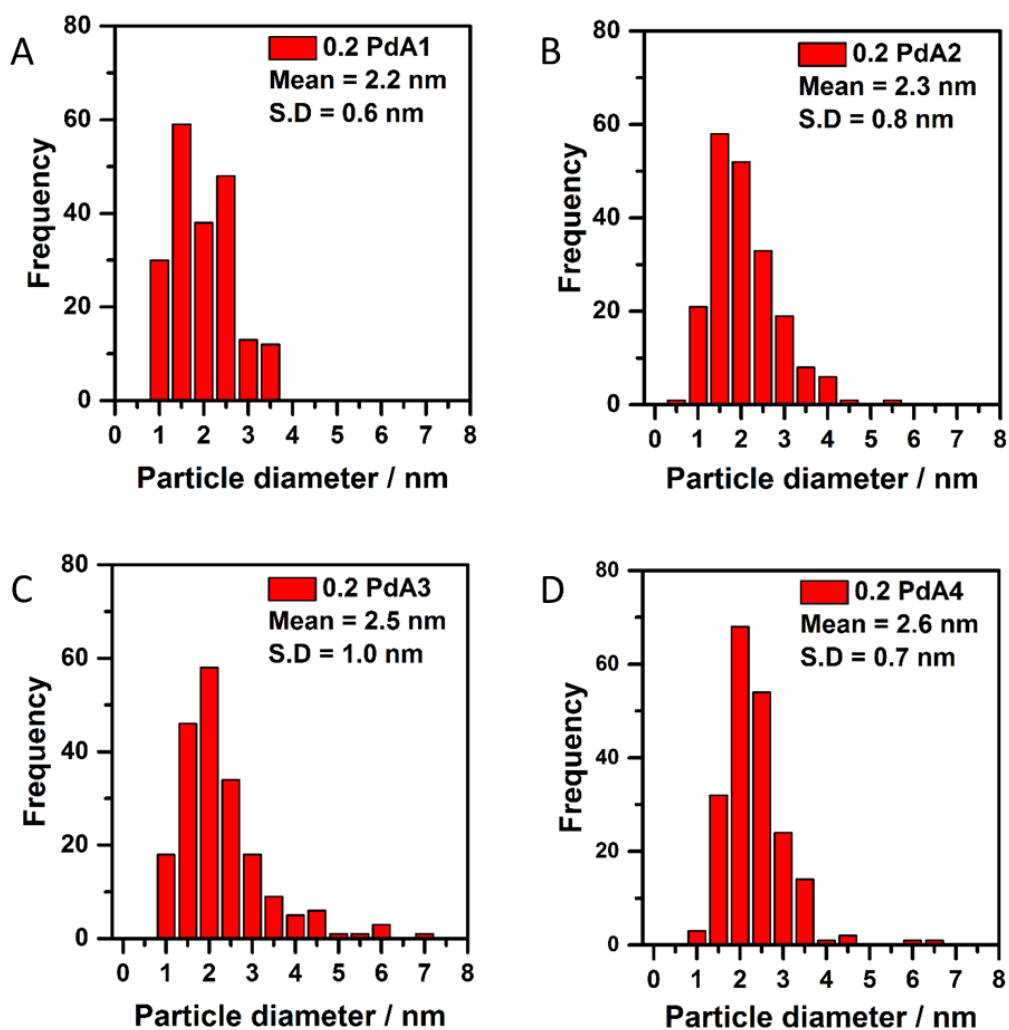


Figure S3. Pd particle size distribution histograms of 0.2 wt. % Pd/TiO₂ catalysts prepared at different temperatures, in H₂O solvent environment; A) 1°C (0.2 PdA1), B) 25°C (0.2 PdA2), C) 50°C (0.2 PdA3) and D) 75°C (0.2 PdA4).

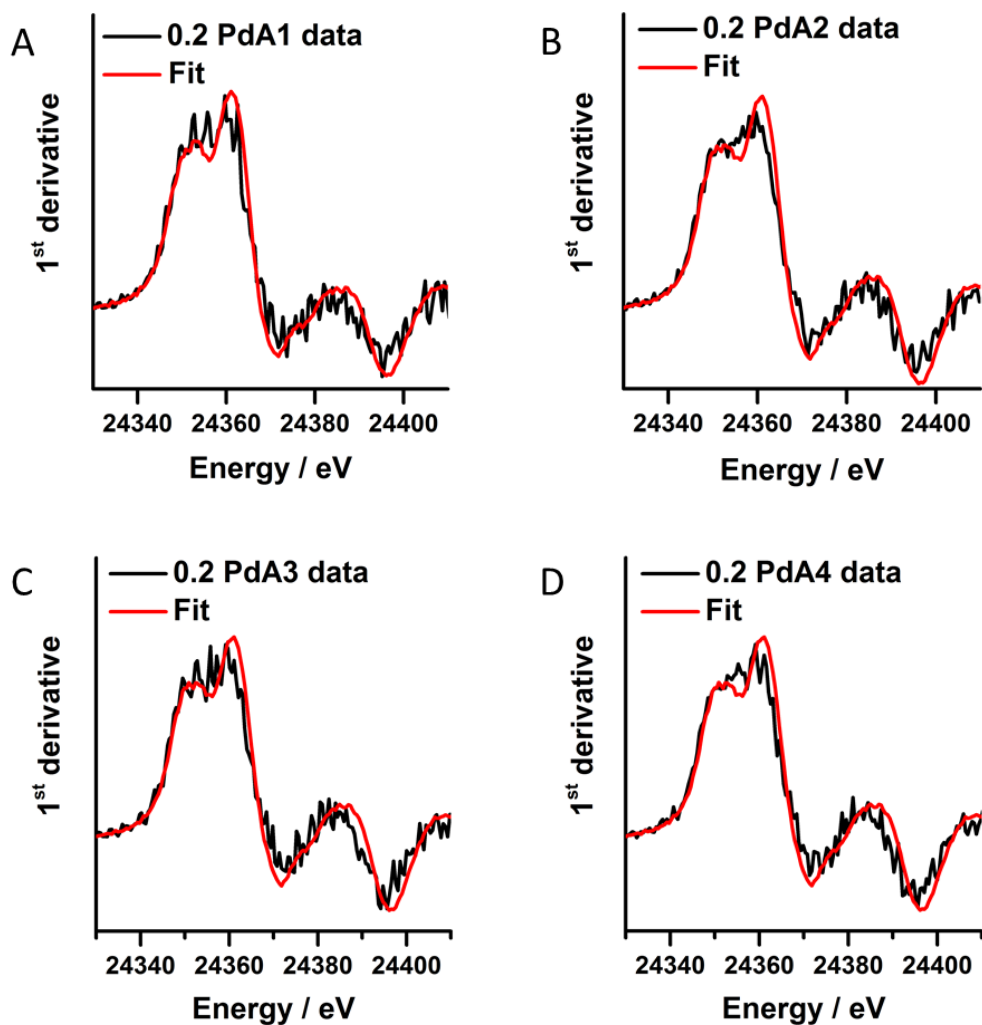


Figure S4. Linear combination fits for the different 0.2 wt. % Pd/TiO₂ catalysts using PdO and Pd foil as reference materials; A) 1°C (0.2 PdA1), B) 25°C (0.2 PdA2), C) 50°C (0.2 PdA3) and D) 75°C (0.2 PdA4).

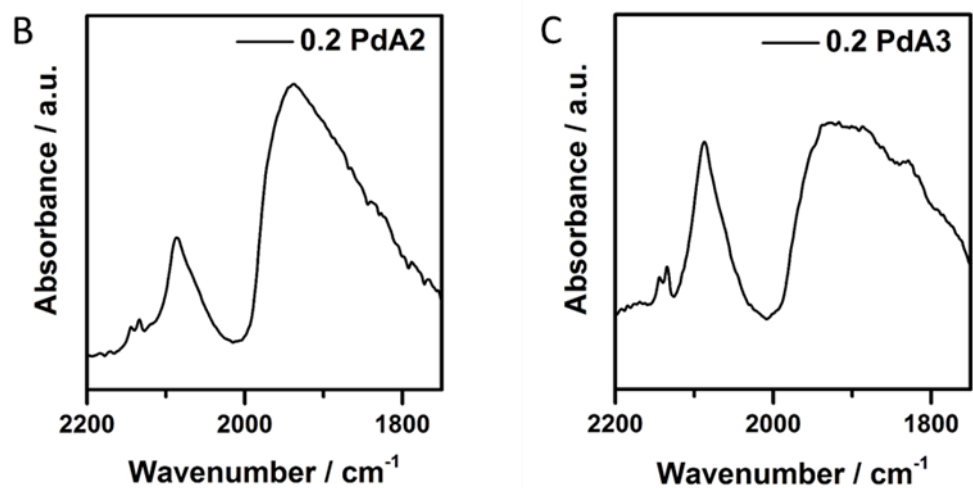
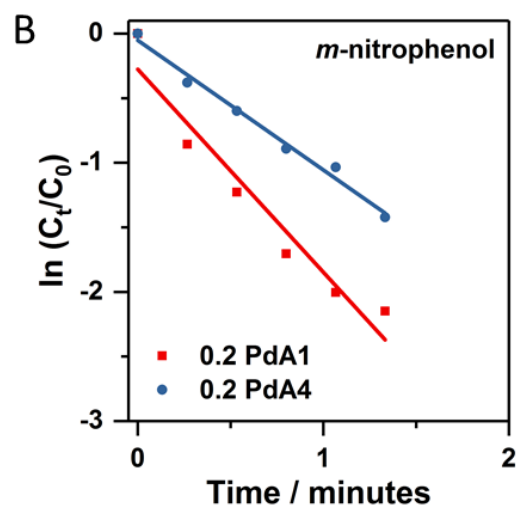
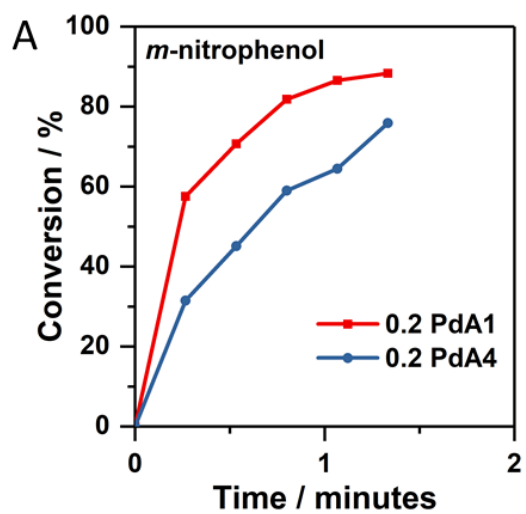


Figure S5. FTIR spectra from CO-adsorption studies onto different 0.2 wt. % Pd/TiO₂ catalysts: (B) 0.2 Pd30, (C) 0.2 Pd50.



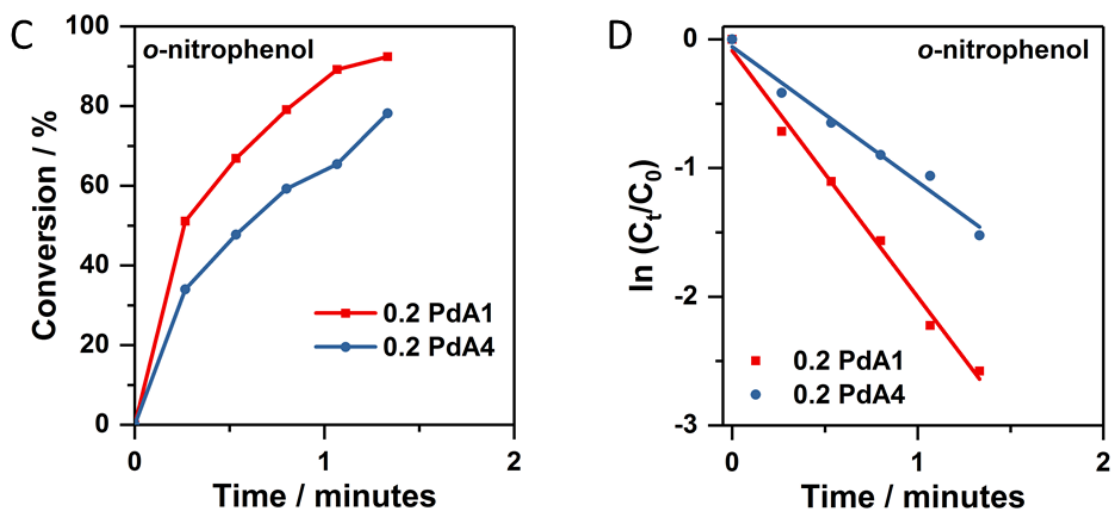


Figure S6. Conversion profiles of Pd catalysts for the hydrogenation of (A) *m*-nitrophenol and (C) *o*-nitrophenol. $\ln(C_t/C_0)$ versus time plots for Pd catalysts tested for (B) *m*-nitrophenol and (D) *o*-nitrophenol hydrogenation. Reaction conditions: *m*-nitrophenol: Pd molar ratio = 36, *o*-nitrophenol: Pd molar ratio = 14 NaBH_4 : nitrophenol molar ratio = 24.