

Supporting Materials

Effect of Polyvinylpyrrolidone (PVP) on Palladium Catalyst for Direct Synthesis of Hydrogen Peroxide from Hydrogen and Oxygen

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Table S1. Catalytic activities for Pd/SiO₂ and Pd-PVP catalysts under different reduction conditions.

Catalysts	Reduction Temperature (°C)	H ₂ conversion (%)	H ₂ O ₂ selectivity (%)	H ₂ O ₂ production rate (mmol _{H₂O₂} g _{Pd} ⁻¹ h ⁻¹)
Pd/SiO ₂	60	12.8	31.1	702.5
	150	15.7	26.8	750.3
Pd-PVP(1)	60	13.2	42.4	1001.4
	150	13.4	41.8	987.6
Pd-PVP(2)	60	8.2	44.4	652.3
	150	8.3	42.7	624.5
Pd-PVP(3)	60	5.4	51.9	503.2
	150	5.6	51.2	509.4

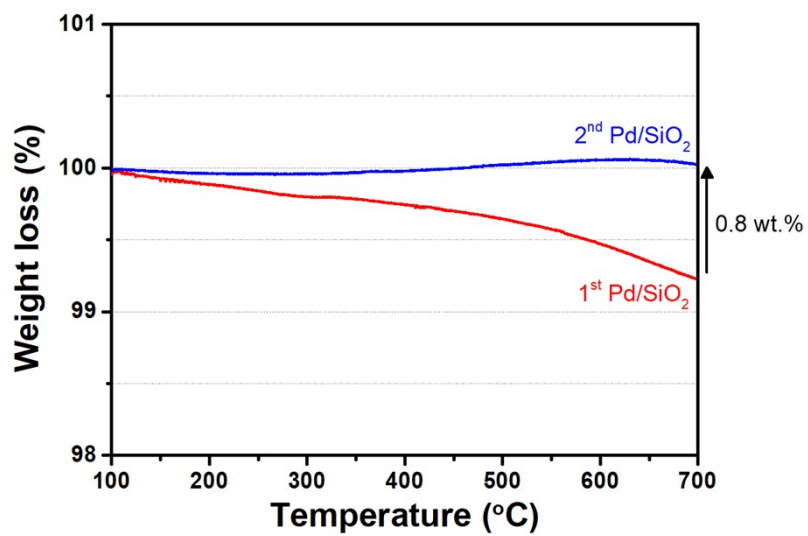


Figure S1. TGA data of fresh Pd/SiO₂ (1st Pd/SiO₂) and successive second run of 1st Pd/SiO₂ (2nd Pd/SiO₂).

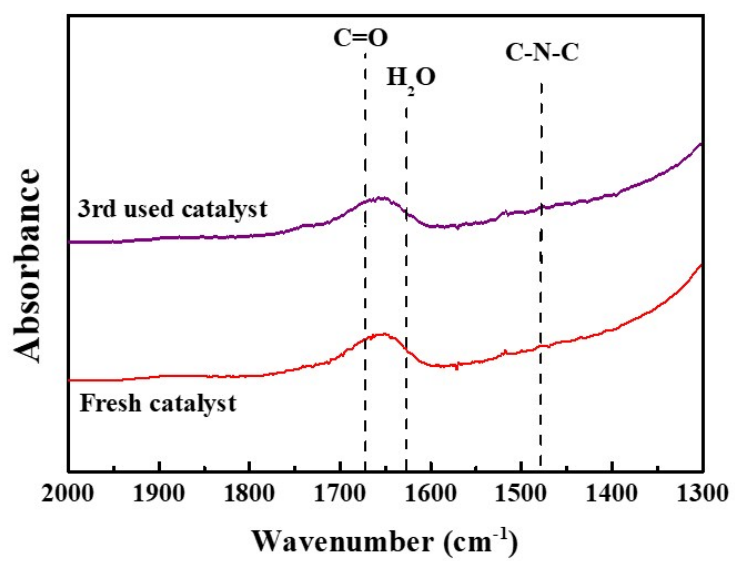


Figure S2. FT-IR spectra of fresh Pd-PVP(1) and 3rd used Pd-PVP(1) in the range between 2000-1300 cm⁻¹ that contains bonds indicating PVP.