

Electronic Supplementary Information

Highly selective hydrogenation of furfural to furfuryl alcohol over Pt nanoparticles supported on g-C₃N₄ nanosheets catalysts in water

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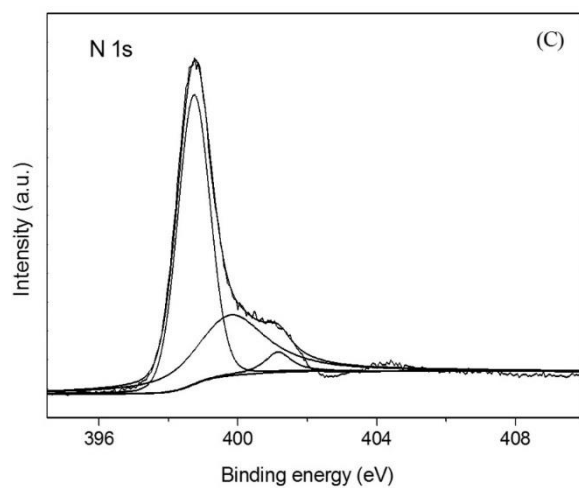
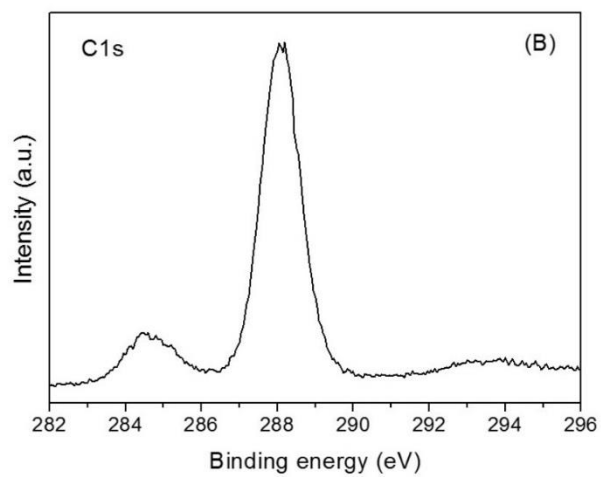
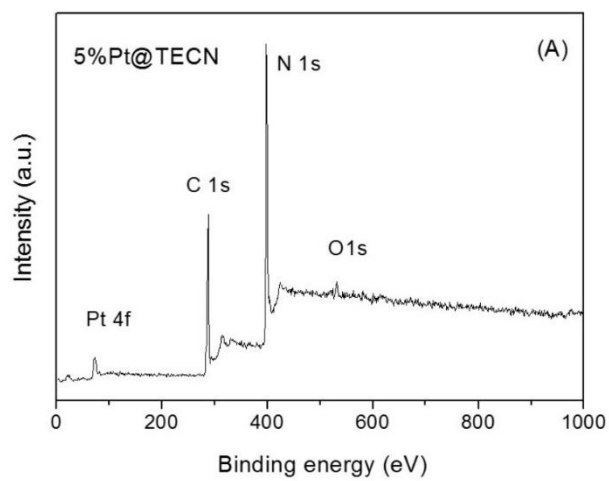


Figure S1 (A) XPS survey spectrum of 5%Pt@TECN catalyst, XPS spectra of (B) C1s, (C) N 1s.

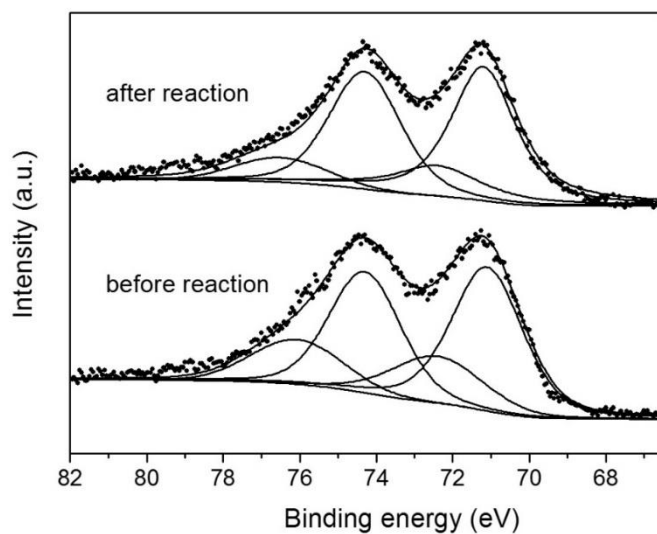


Figure S2. XPS spectra in the Pt 4f region of fresh and spent 5% Pt@TECN catalysts.

Table S1. Furfural hydrogenation over Pt catalysts after 1 h reaction in aqueous phase at 100 °C.

Entry	Catalyst	Conv. (%)	Furfuryl alcohol Sel. (%)
1	5% Pt@TECN	90.3	>99
2	5% Pt@C	51.1	>99

Reaction conditions: Pt catalyst (0.24 mol% Pt relative to substrate), 20 mL H₂O, 0.4 mL furfural, 1.0 MPa H₂, 100 °C, 1 h.

Gas-chromatographic analysis of the reaction mixture from Table 1, entry 7 and Table 2, entry 1.

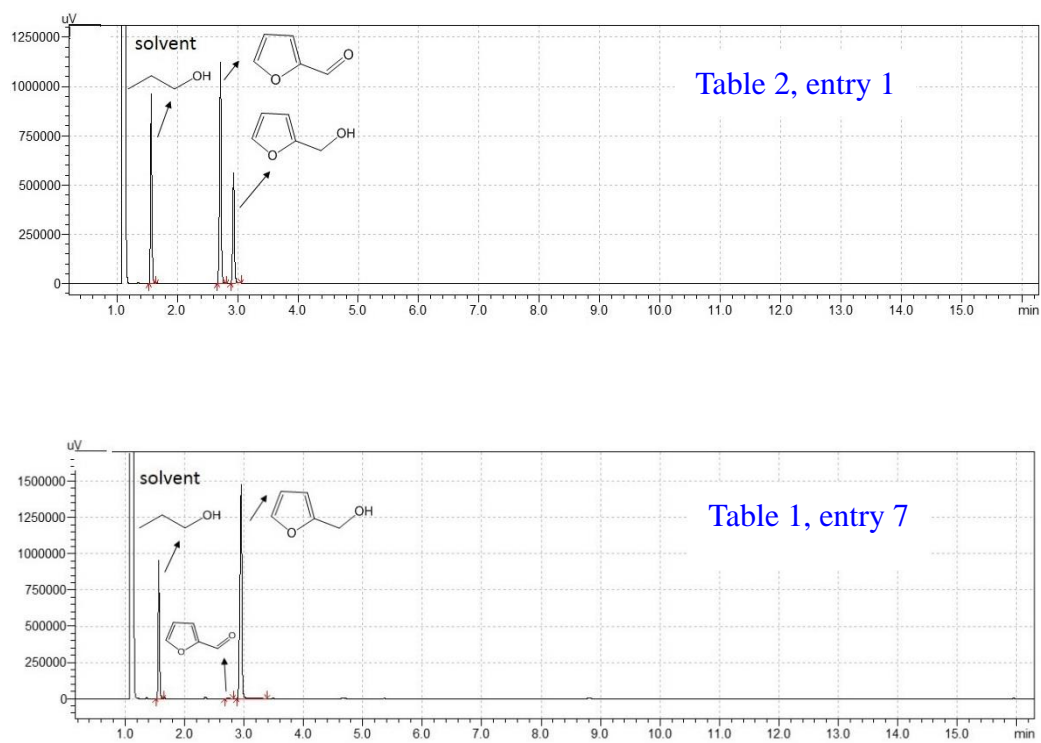


Figure S3. Representative GC spectrums of furfural hydrogenation in water.

NMR analysis of the reaction mixture from Table 1, entry 7.

The reaction mixture was obtained by furfural hydrogenation over 5%Pt@TECN under 1MPa H₂ for 5 h in water (Table 1, entry 7). Then the reaction mixture was extracted with EtOAc, the organics were dried (Na₂SO₄), concentrated and analysed by NMR. The NMR analysis (see figure S4) confirmed that the main product of the reaction was furfuryl alcohol.

¹H NMR (600 MHz, CDCl₃) δ 7.36 (d, 1H), 6.30 (t, 1.08H), 6.24 (d, 1.06H), 4.51 (d, 2.1H), 3.22 (br s, 0.98H).

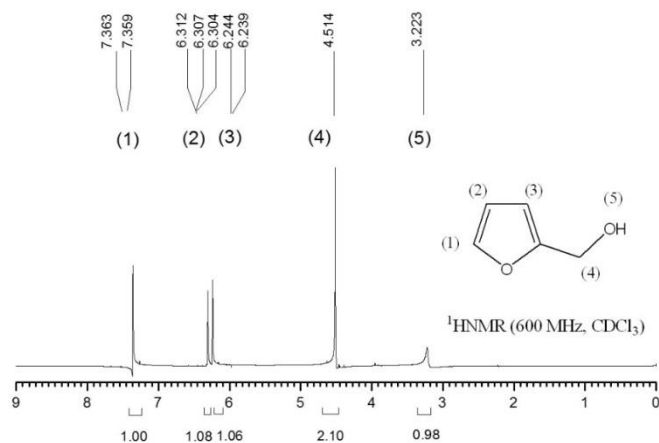


Figure S4. The ¹H NMR spectra of the reaction mixture.

Quantitative GC analyses

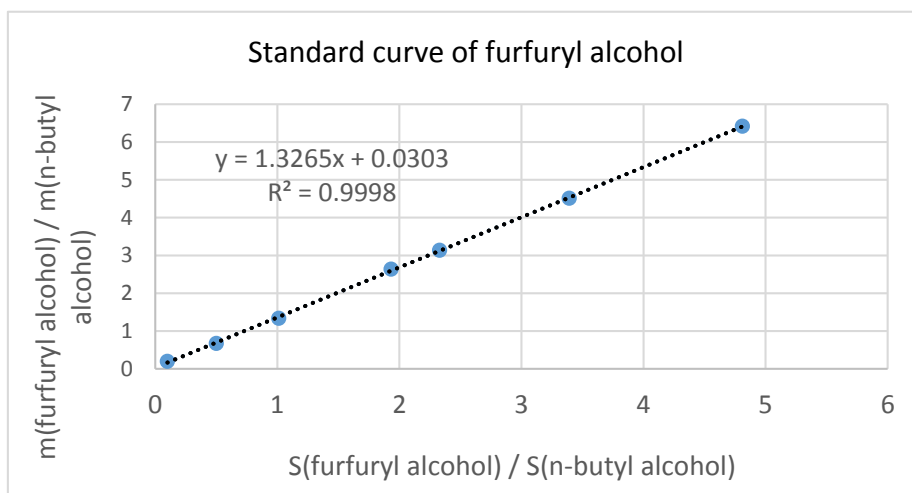
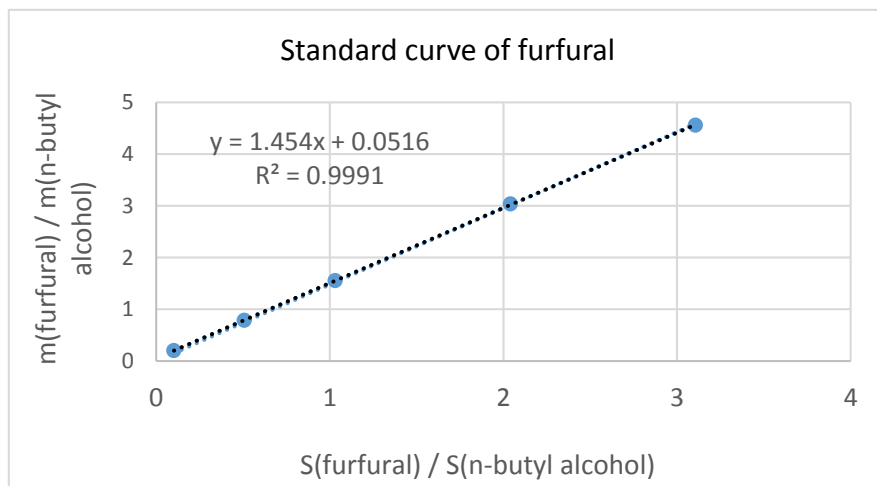


Figure S5. Standard curve of furfural with n-butyl alcohol and furfuryl alcohol with n-butyl alcohol.