Supplemental information

Catalytic dehydration of D-xylose to furfural over a tantalum-based catalyst in batch and continuous process

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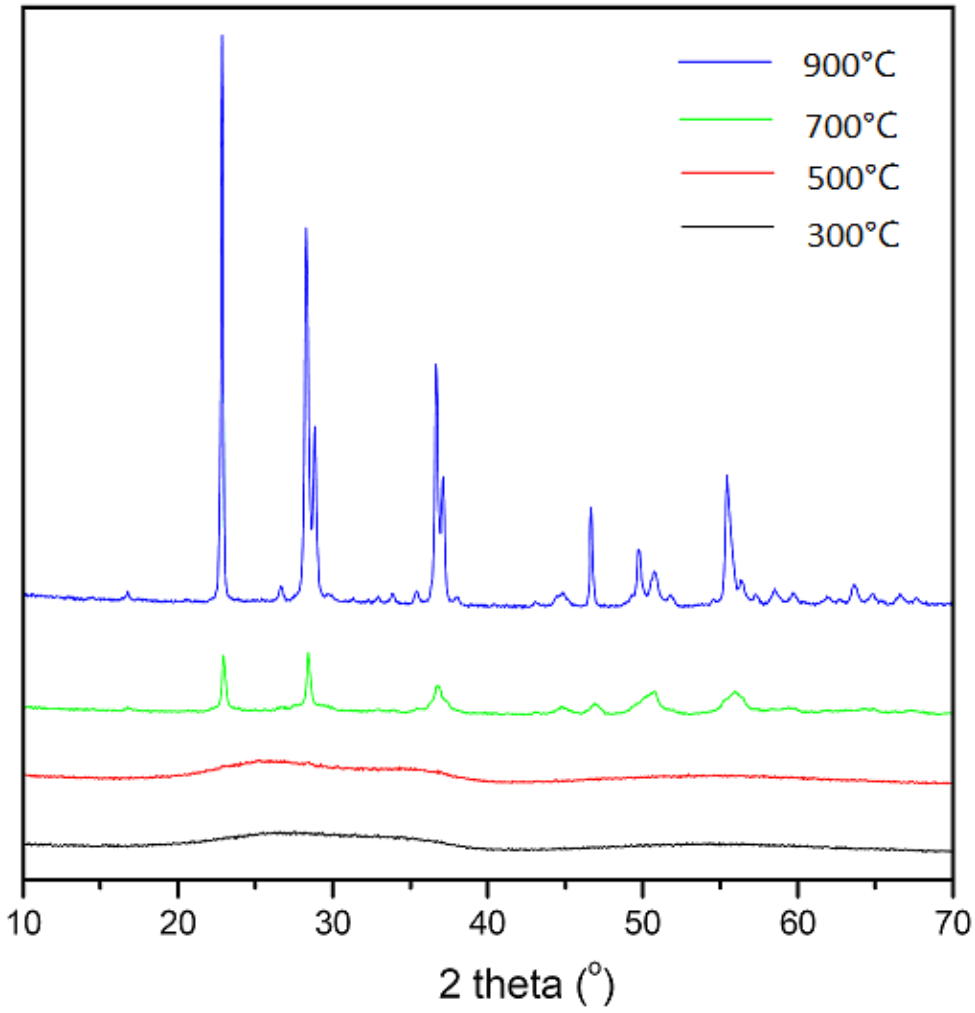

Fig S1. XRD patterns of the TA-p catalyst at different calcination temperature

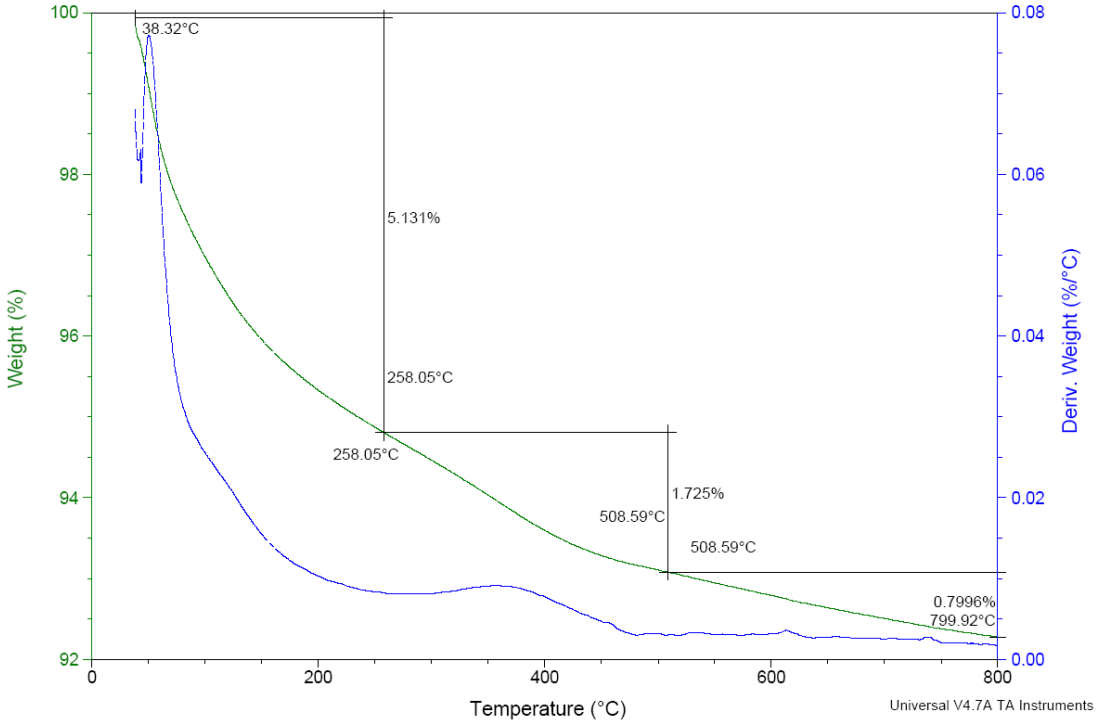

Fig S2. TG-DSC curve of the TA-p-300 catalyst

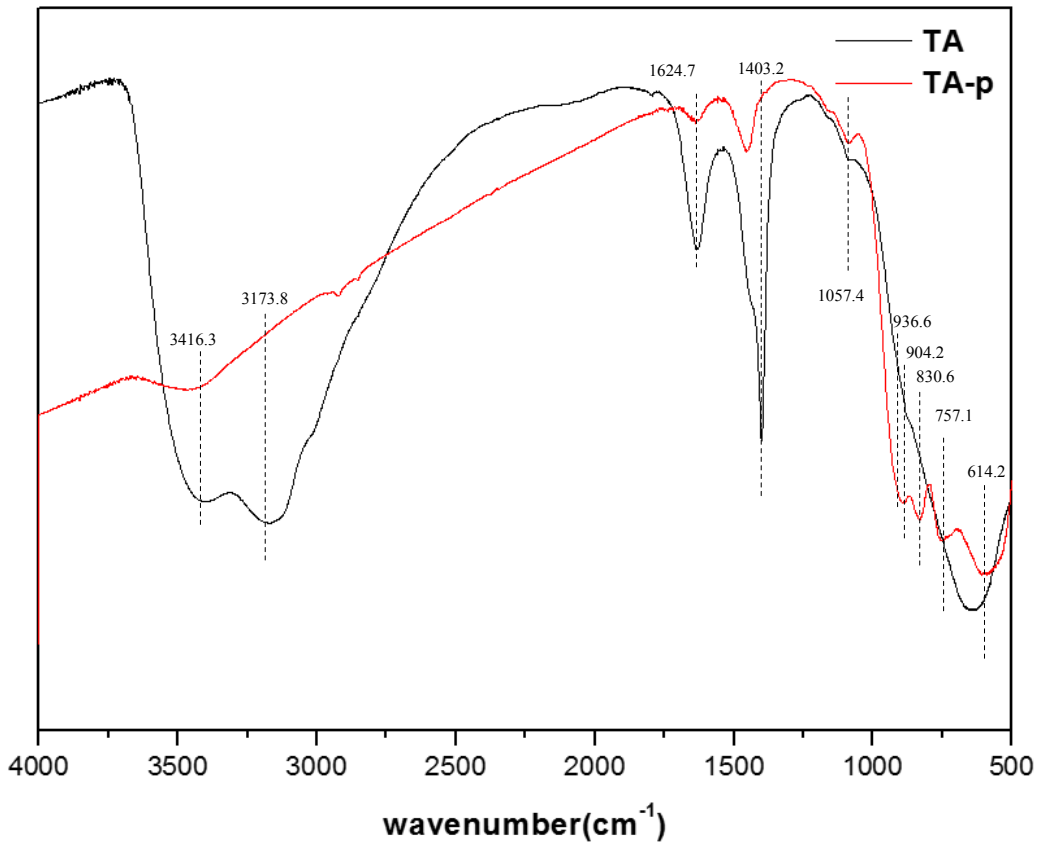

Fig S3. FTIR spectra of the TA and TA-p-300 catalyst

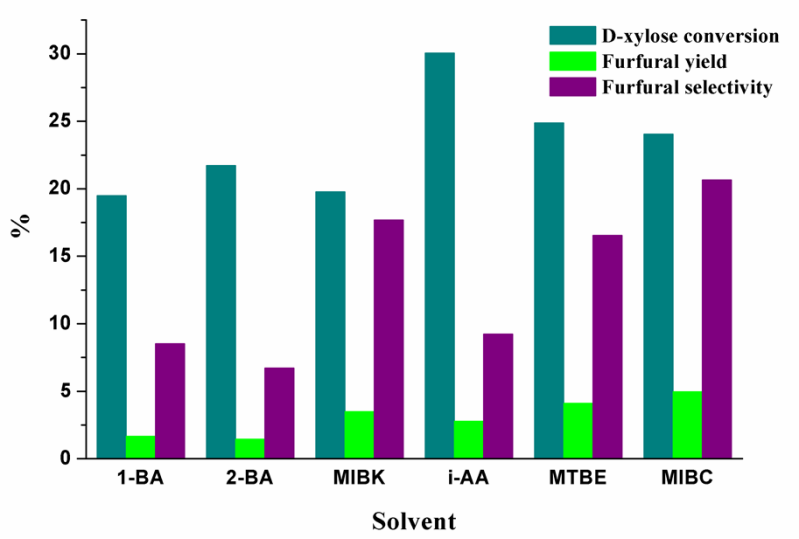

Fig. S4. The blank experiments without catalysts in six different organic solvents. Conversion of D-xylose and yield of furfural were calculated by HPLC. Reaction conditions: 0.4 g of D-xylose, 400 mg of catalyst, 4 mL of water and 6 mL of organic solvent, 160 °C, 3 h.

Table S1. The effect of NaCl on the BET surface area and the acid density of catalyst.[a]

Entry	Catalyst	BET /$m^2 \cdot g^{-1}$	Acid density /$mmol \cdot g^{-1}$
1[b]	TA-p-300	139.6	1.6
2[c]	TA-p-300	132.5	1.5
3[d]	TA-p-300	120.3	1.2

[a] Acid density was measured by NH_3-TPD.
[b] The catalyst was freshly prepared.
[c] The catalyst was collected and dried at 110 °C after reaction without adding of NaCl. Reaction condition: 0.4 g of D-xylose, 400 mg of catalyst, 4 mL of water and 6 mL of MIBC, 160 °C, 3 h.
[d] The catalyst was collected and dried at 110 °C after reaction with adding of NaCl. Reaction condition: 0.4 g of D-xylose, 0.4 g of NaCl, 400 mg of catalyst, 4 mL of water and 6 mL of MIBC, 160 °C, 3 h.

Table S2. The effect of single-phase solvent system on the conversion of D-xylose to furfural.

Entry	Catalyst	Solvent	Conversion of D-xylose (%)	Yield of furfural (%)
1	TA-p-300	Water	80.2	28.5
2	TA-p-300	1-butanol	63.5	16.7

Reaction condition: 0.4 g of D-xylose, 400 mg of catalyst, 160 °C, 3 h.