Electronic Supplementary Material (ESI) for Green Chemistry.

Supporting Information

Base-free Aerobic Oxidation of 5-Hydroxymethylfurfural to 2,5-Furandicarboxylic Acid over Pt/C-O-Mg Catalyst

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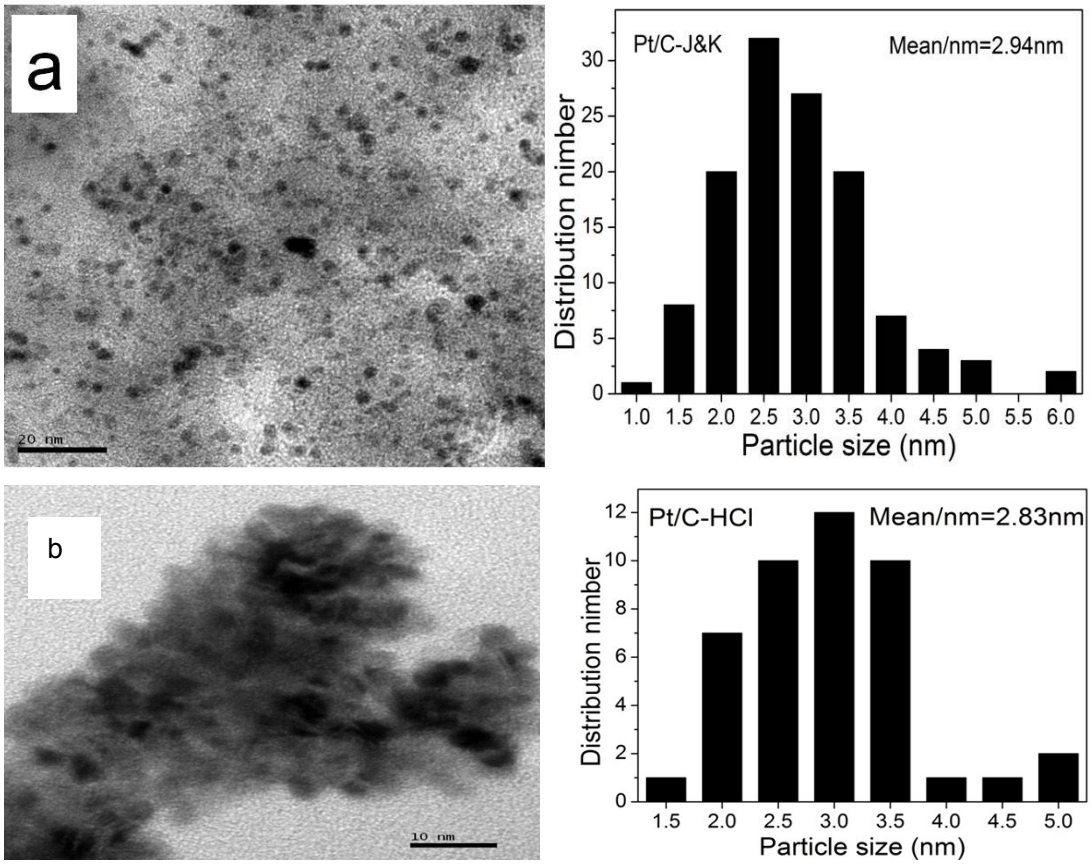

Fig. S1 TEM images of Pt/C-J&K (a) and Pt/HTC-HCl (b) catalyst and the corresponding particle size distribution.

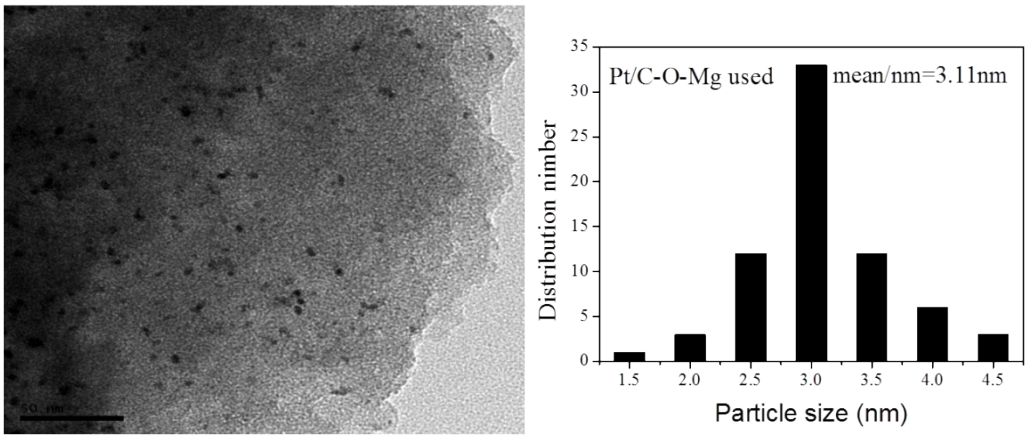

Fig. S2 TEM image of the used Pt/C-O-Mg catalyst and the corresponding particle size distribution.

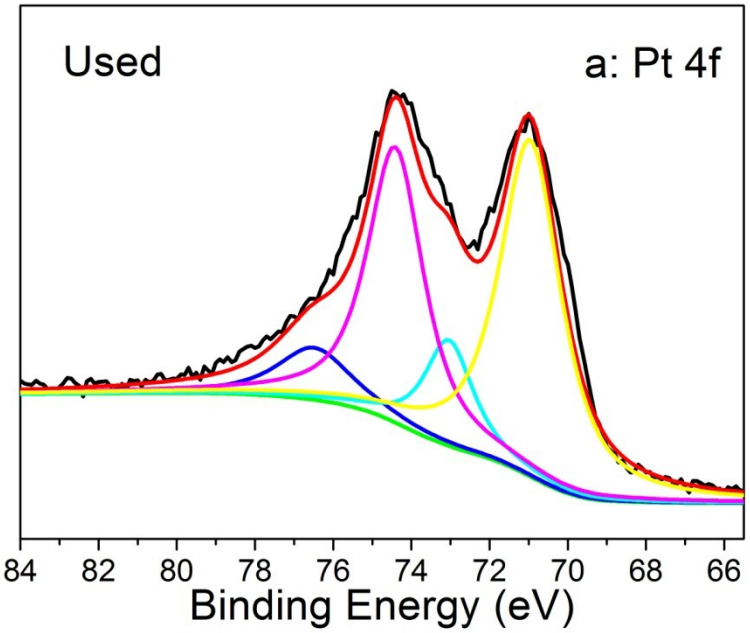

Fig. S3 XPS spectra of Pt/C-O-Mg (used 3 times) catalysts and fitting curves: (a) Pt 4f.

Table S1. Catalytic results of HMF oxidation in water using different catalysts under base-free conditions.

Entry	Cata.	Conv. (%)	Y_{FDCA} (%)	Y_{FFCA} (%)	Y_{DFF} (%)
1	Pt/MgO	>99	95.5	0	0
2	Pt/MgO-C	>99	99.2	0	0
3	Pt/C-J&K	>99	62.8	0.3	0
4	Pt/C-O-Mg	>99	97.0	1.2	0
5	Pt/HTC	>99	77.2	13.1	0
6	Pt/HTC-HCl	>99	58.9	26.3	0

Reaction conditions: HMF (0.5 mmol), H_2O (10 ml), catalysts (0.04 g), molar ratio HMF/Pt = 50, 110 °C, 12 h, O_2 1.0 MPa.

Table S2. Catalytic results of HMF oxidation in different solvent results.

Entry	Cat.	Solvent	Conv.(%)	Y_{FDCA}(%)	Y_{FFCA}(%)	Y_{DFF}(%)	Ref.
1	γ-Fe_2O_3@HAP-Pd[a]	Ethanol	19.1	16.1	--	1.2	1
2	CuCl[b]	MeCN	100	50	0	0	2
3	Au/TiO_2[c]	methanol + MeONa	100	98*	0	0	3
4	Au/CeO_2[d]	MeOH	100	>99*	0	0	4

*: Furan-2,5-dimethylcarboxylate.

Reaction conditions: a): HMF (50.4 mg, 0.4 mmol), solvent (8 mL), γ -Fe_2O_3@HAP-Pd(0) (40 mg), oxygen flow rate (30 mL min−1), 100 °C, 6h. b): HMF (1 mmol), TEMPO (0.1 mmol), CuCl (0.1 mmol), solvent (5 mL), 24 h, 1 bar air, RT. c): 0.32 M HMF, 130°C, 0.4 MPa O_2. d): 130°C, 1 MPa O_2.

References

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