Supplementary Information

Hierarchically porous single catalyst Ru/HPW/UiO-66 with synergistic acid/metal sites for one-pot catalytic synthesis of γ–Valerolactone

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Table S1. Physicochemical properties of various Ru Catalysts.

| Catalyst	S_{BET}[a] m^2/g	V_{total}[b] cm^3/g
UiO-66	676.4	0.31
HP-UiO-66	720.7	0.74
0.14 wt% Ru/HPW/HP-UiO-66	508.0	0.52
0.83 wt% Ru/HPW/HP-UiO-66	322.5	0.29
1.40 wt% Ru/HPW/HP-UiO-66	295.2	0.27

[a] BET specific area; [b] Total pore volume.

Table S2. Catalytic Performance of various Ru Catalysts in the Hydrogenation of methyl levulinate (ML)[a]

Entry	Catalyst	Conversion (%)	Selectivity (%)	
			GVL	other[b]
1	-	28.6	0	100
2	HP-UiO-66	95.3	0	100
3	Ru/HP-UiO-66	98.6	15.8	84.2
4	Ru/HPW/UiO-66	100	30.2	69.8
5	0.14 wt% Ru/HPW/HP-UiO-66	97.5	37.4	62.6
6	0.83 wt% Ru/HPW/HP-UiO-66	97.1	100	0
7	1.40 wt% Ru/HPW/HP-UiO-66	92.7	100	0

[a] Reaction conditions unless specified otherwise: 8 mL of H_2O, 80mg of ML, 20mg of catalyst, 1MPa of H_2, 120°C, 12h;
[b] Byproducts mainly include γ-hydroxyvaleric acid, levulinic acid, and other unknown products.
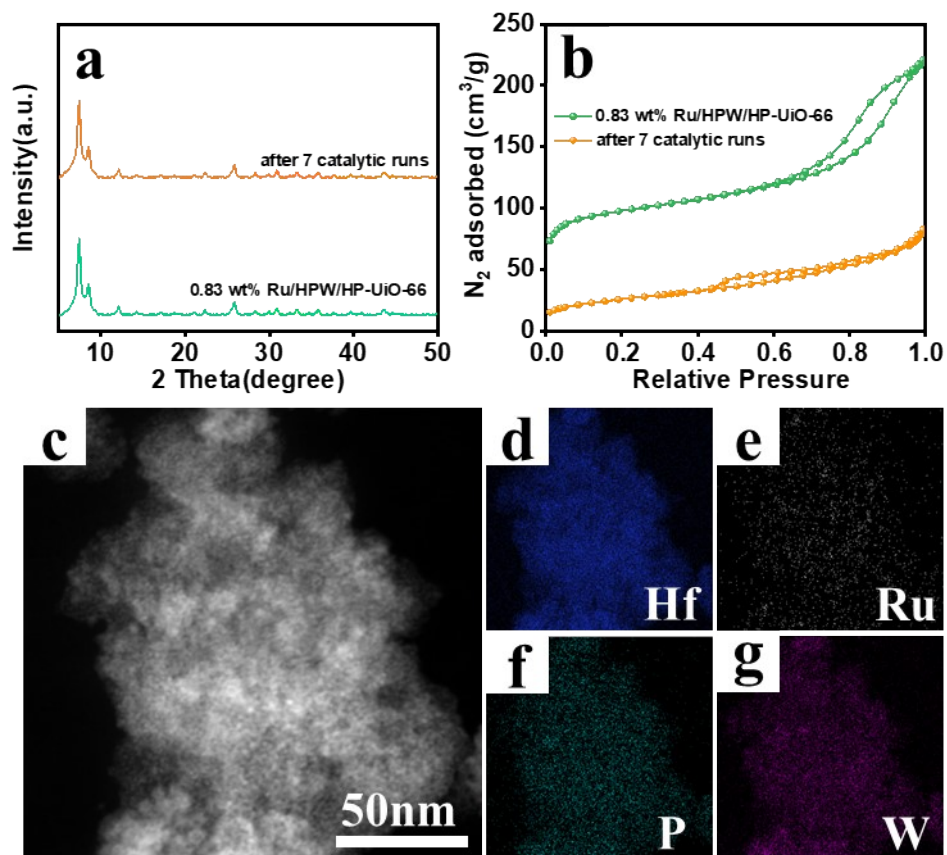
Figure S1. (a) XRD patterns, (b) N_2 adsorption-desorption isothermals, (c) TEM image and (d, e, f, g) corresponding EDX elemental mapping of 0.83 wt% Ru/HPW/HP-UiO-66 after 7 catalytic runs.