

Aluminum ion intercalation mesoporous multilayer carbocatalyst promotes the conversion of glucose to 5-hydroxymethylfurfural

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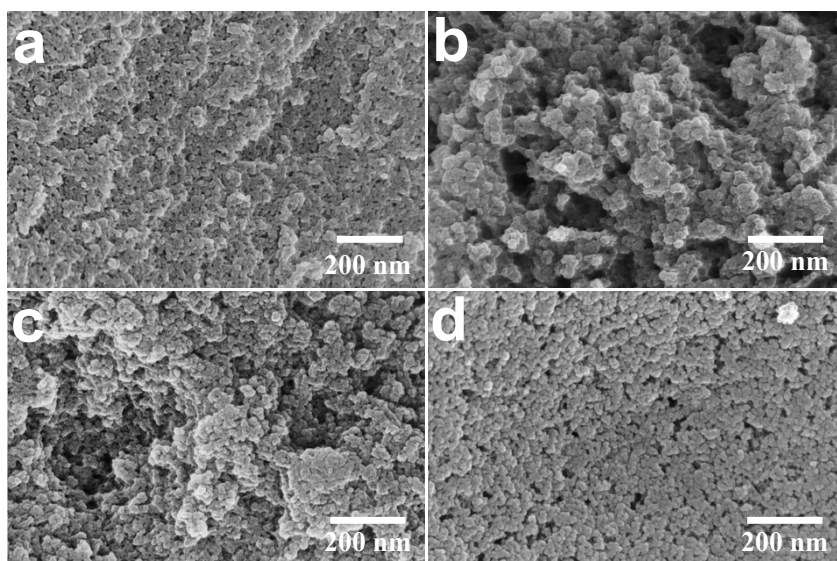


Fig. S1 SEM of different carbon materials (a) SC (b) PSCA; (c) Al-PSCA1; (d) Al-PSCA3.

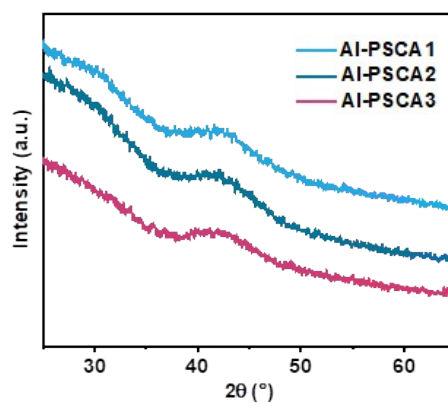


Fig. S2 XRD analysis of Al-PSCA carbocatalysts.

Table S1 XPS analysis and Raman analysis results of carbon materials

Samples	Chemical composition (at%)					Raman analysis (I_D/I_G)
	C	O	S	Cl	Al	
SC	73.52	26.48	0.64	0	0	0.29
PSCA	76.34	19.92	3.74	0	0	0.37
Al-PSCA1	77.06	19.54	1.37	0.46	1.57	0.32
Al-PSCA2	74.55	20.38	2.97	0.36	1.74	0.33
Al-PSCA3	76.25	17.44	4.15	0.34	1.82	0.35

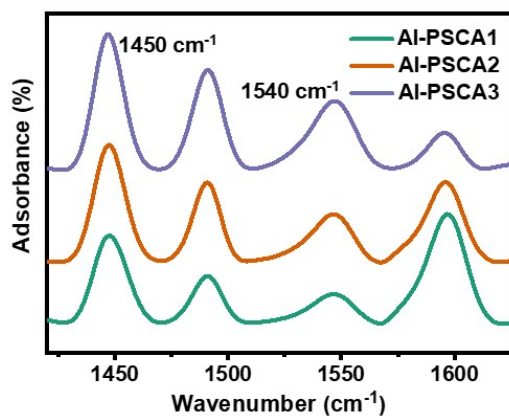


Fig. S3 Py-FTIR analysis of Al-PSCA catalysts.

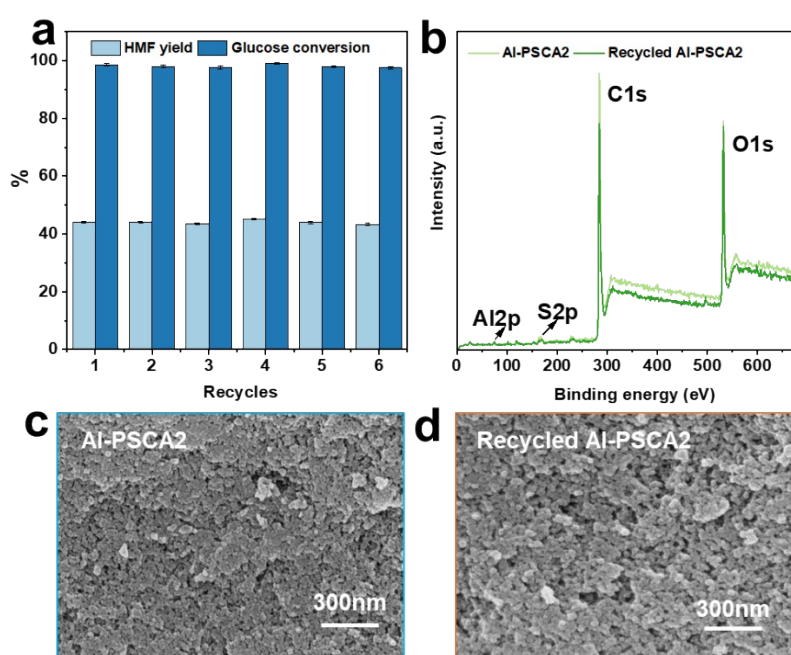


Fig. S4 Recyclability of catalysts. (a) Catalysts recycle, (b) XPS analysis, SEM analysis of Al-PSCA2 (c) and recycled Al-PSCA2 (d). Reaction condition: 20 mL THF-H₂O ($V_{\text{THF}}/V_{\text{H}_2\text{O}}=4/1$), 150 °C 2 h, 0.5 mM glucose, 90 mg catalysts.

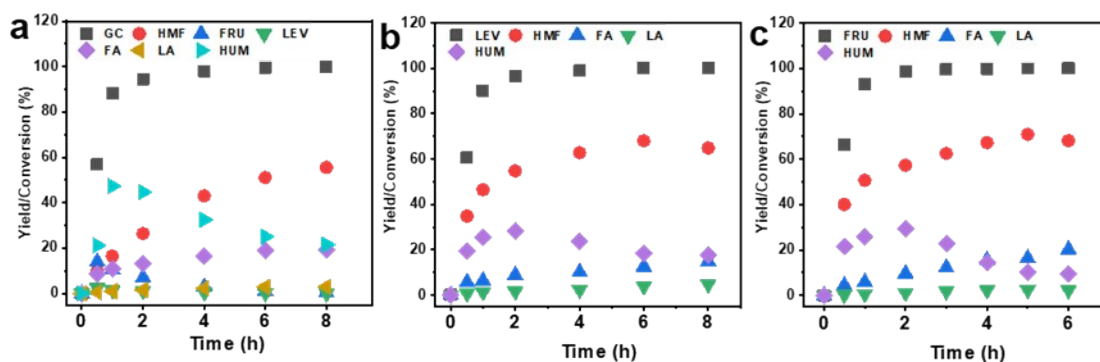


Fig. S5 Experimental (points) versus calculated kinetic parameter. (a) glucose, (b) levoglucosan, (c) fructose Reaction condition: 20 mL THF-H₂O ($V_{\text{THF}}/V_{\text{H}_2\text{O}}=4/1$), 140°C, 0.5 mM substrates, 90 mg catalysts.