Supporting file

Efficient Dual Acidic Carbo-Catalyst for One-pot Conversion of Carbohydrates to Levulinic Acid



Fig. S1: ¹H-Spectrum of crude LA product obtained from one-pot conversion glucose using ZrNyC catalyst in H₂O-THF. Reaction conditions: glucose =100 mg, ZrHyC =20 mg, time = 30 min and temperature 65 °C.



Fig. S2: clean ¹H-NMR of LA product obtained from one-pot conversion glucose using ZrHyC catalyst in H₂O-THF, Reaction conditions: glucose =100 mg, ZrHyC =20 mg, time = 30 min and temperature 65 °C



Fig. S3: (a) FESEM-EDS Chromatogram of as synthesized catalyst and (b) Figure FESEM-EDS Chromatogram of catalyst after 3rd cycle



Fig. S4: FESEM elemental mapping of as synthesized ZrHyC showing four elements (Zr, O, Cl and C) respectively.



Fig. S5: Narrow scan-XPS spectra of as synthesized ZrHyC catalyst.



Fig. S6: ¹H NMR spectra as a function of time for the dehydration of glucose in DMSO-d₆ at 130 °C. Reaction condition: glucose (20 mg), catalyst (ZrHyC, 5 mg), DMSO-d₆ (0.5 mL), in J-Young NMR tube, under oil bath heating.



Fig. S7. The recyclability study of the ZrHyC catalyst for glucose conversion to LA. Reaction condition: 100 mg Glucose, 20 mg catalyst, 20 min reaction time and 65 °C.