Electronic Supplementary Material

Benzenesulfonic acid-grafted UIO-66 with improved hydrophobicity as a stable Brønsted acid catalyst

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The cyclohexyl acetate conversion, the selectivity to cyclohexanol were defined as follows:

$$X = \frac{m_{ca0(g)} - m_{ca1(g)}}{m_{ca0(g)}} \times 100\% \tag{S1}$$

$$S = \frac{m_{ca(g)} - m_{cp(g)}}{m_{ca(g)}} \times 100\% \tag{S2}$$

where m_{ca0} is the initial mass of cyclohexyl acetate (*ca*) in the reaction system; m_{ca1} is the final mass of cyclohexyl acetate after the reaction in the system; m_{ca} is the converted cyclohexyl acetate ($m_{ca} = m_{ca0} - m_{ca1}$); m_c is the mass of cyclohexene (*c*) produced.

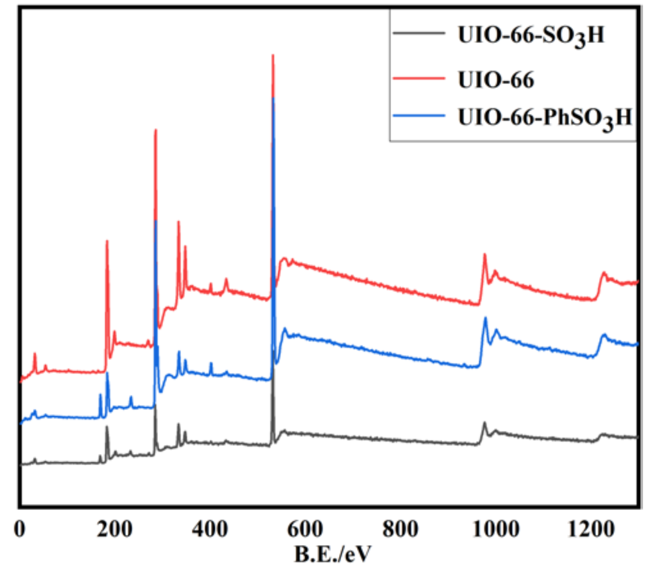

Fig. S1 XPS scan survey of relevant materials

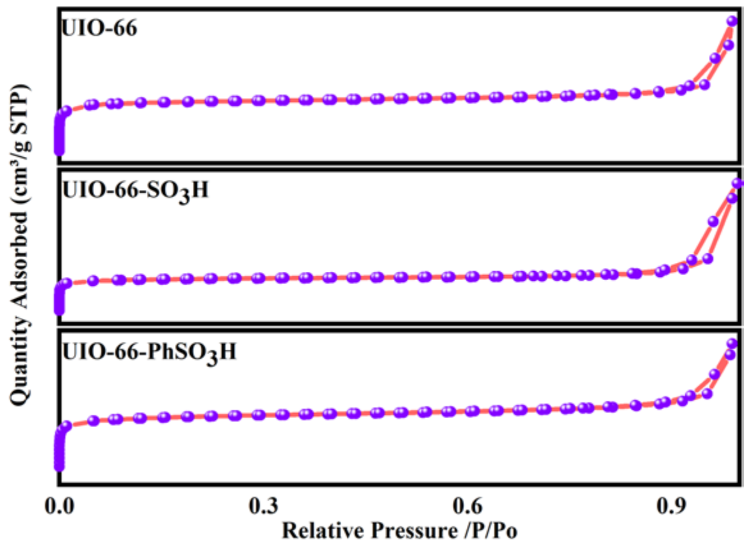

Fig. S2 N_2 adsorption/desorption isotherms of relevant materials

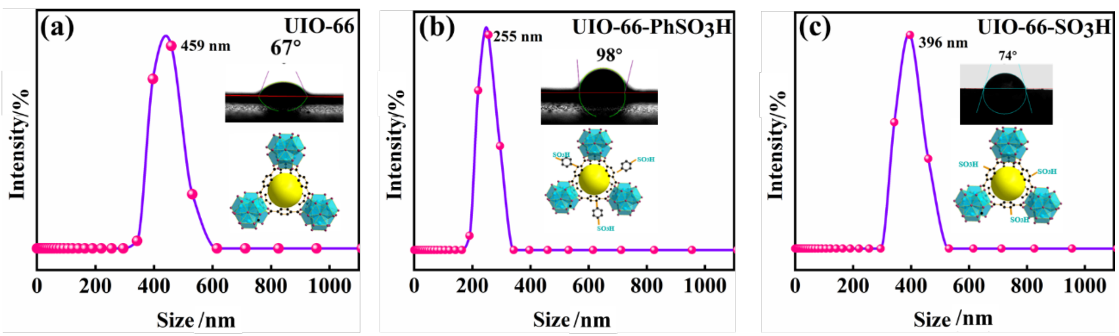

Fig. S3 Particle size analysis of catalysts: particle size distribution of (a) UIO-66, (b) UIO-66-PhSO_3H and (c) UIO-66-SO_3H (insets: the measured contact angles for the materials)

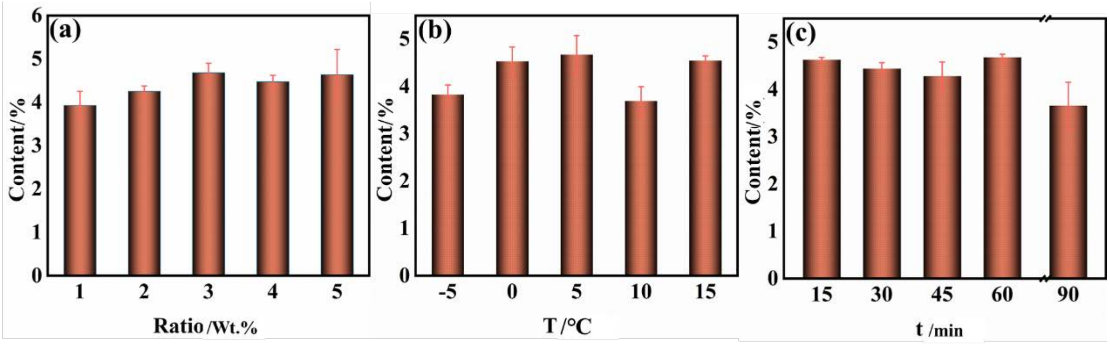

Fig. S4 Catalyst optimization: the effect of (a) the ratio of 4-chlorobenzenesulfonic acid to UIO-66, (b) synthesis temperature and (c) synthesis time on the S content of UIO-66-$PhSO_3H$

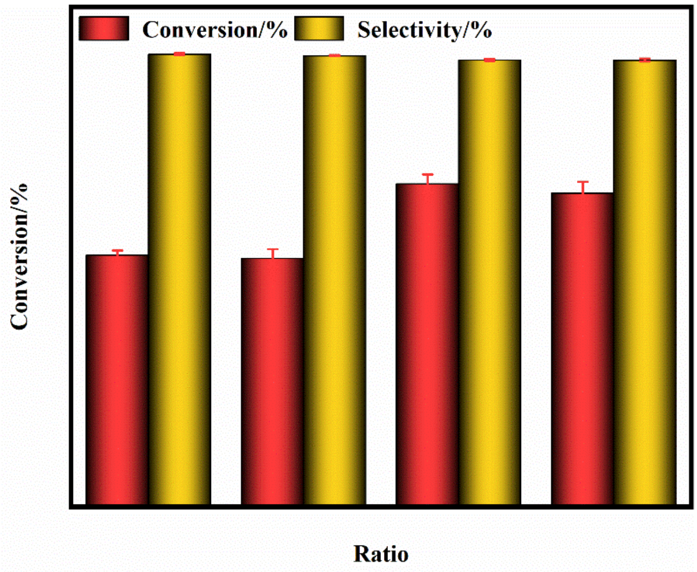

Fig. S5 Variation of cyclohexanol conversion as a function of the water-to-ester ratio

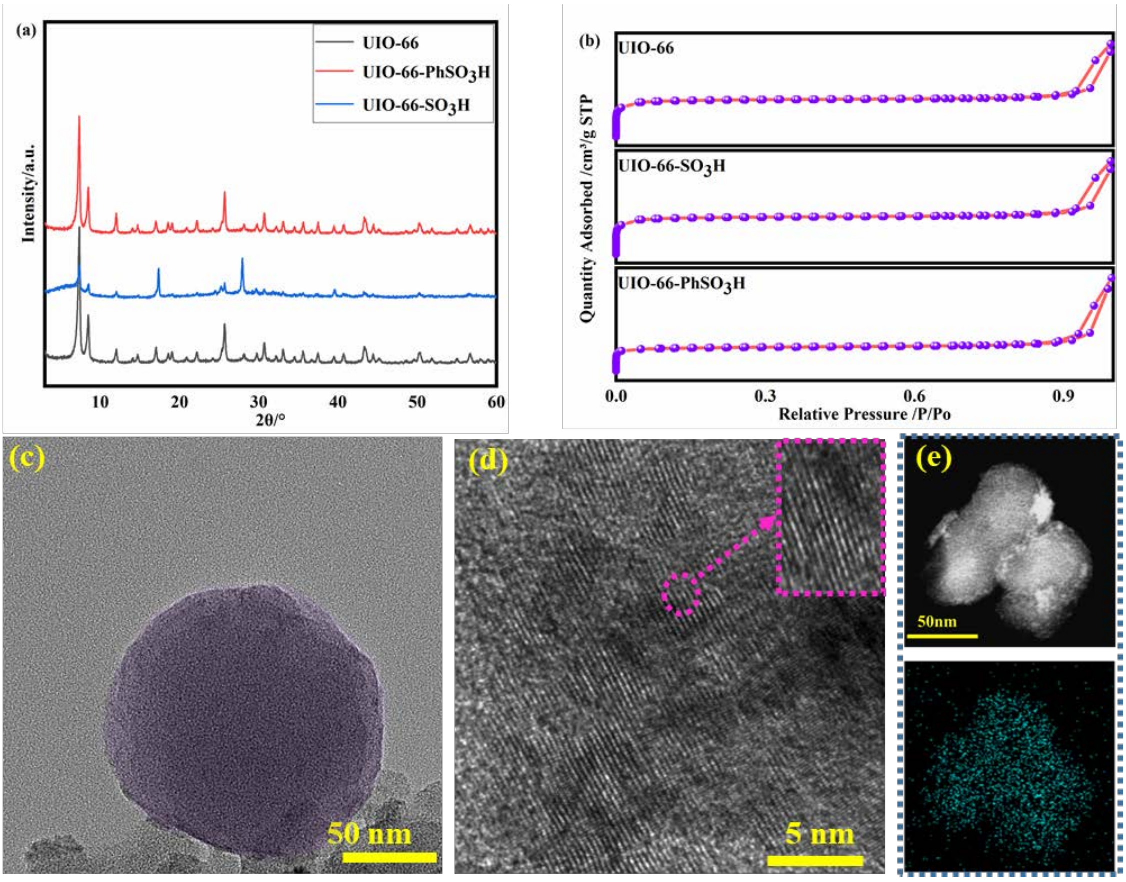

Fig. S6 Structural and morphological analysis of catalysts after regeneration: (a) XRD patterns; (b) N_2 physisorption isotherms of the used catalysts from the stability test; (c,d) morphology and lattice of UIO-66-$PhSO_3H$; (e) EDS mapping analysis

Table S1 Comparison of textual properties of the used materials from the stability tests

Samples	$S_{BET\ original}$ /cm²/g	S_{BET} /cm²/g	$D_{meso\ original}$ /nm	D_{meso} (nm)	$V_{original}$ /cm³/g	V /cm³/g
UIO-66	1,051	1,038	2.1	2.1	0.5	0.6
UIO-66-SO_3H	1,051	648	2.1	2.4	0.5	0.5
UIO-66-$PhSO_3H$	648	731	2.4	2.3	0.4	0.5