

Supporting Information

Adsorptive separation performance of 1-butanol onto typical hydrophobic zeolitic imidazolate frameworks (ZIFs)

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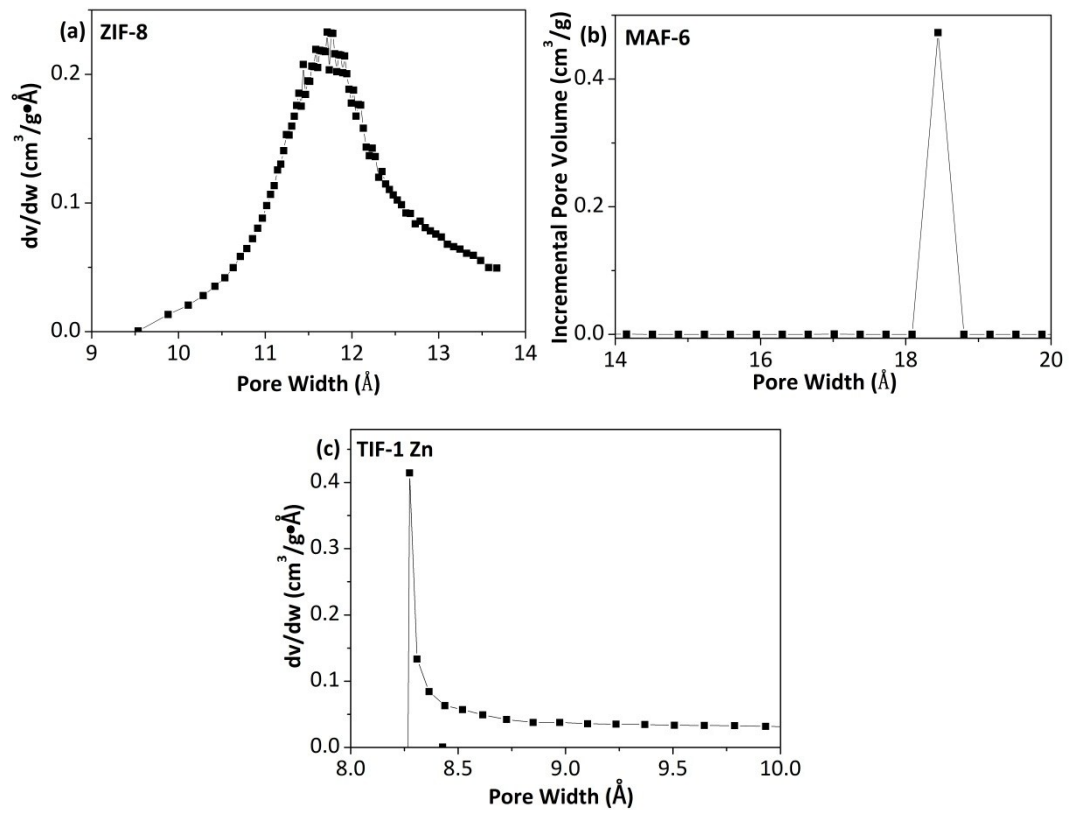


Figure S1 Pore size distribution of the three hydrophobic materials-ZIF-8, MAF-6 and TIF-1 Zn.

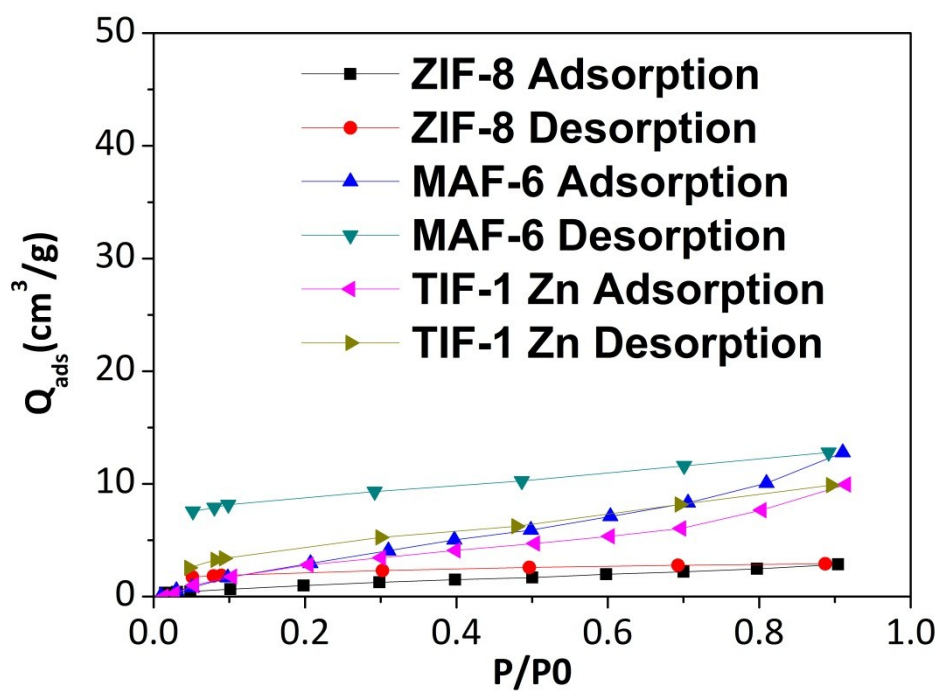


Figure S2 Water vapor adsorption/desorption isotherm of three hydrophobic materials-ZIF-8, MAF-6 and TIF-1 Zn at 298 K.

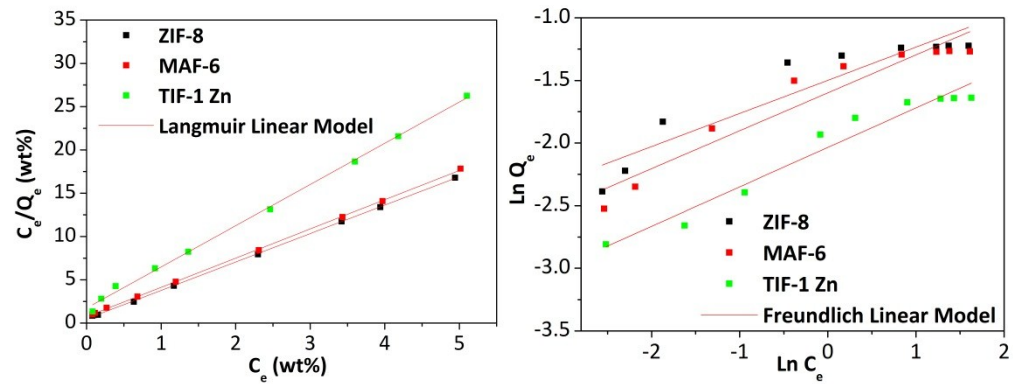


Figure S3 (Left) Langmuir plots of the isotherms and (Right) Freundlich plots of the isotherms for 1-butanol adsorption over the three hydrophobic materials at 25 °C.

Table S1 The adsorption constant of different adsorption models for 1-butanol onto the three hydrophobic materials at 25°C.

Adsorbent	Langmuir isotherm model			Freundlich isotherm model		
	Q_{max} (g/g)	k (L/mol)	R_1^2	K_F (L/mol)	n	R_2^2
ZIF-8	0.304	6.708	0.999	0.223	3.778	0.861
MAF-6	0.287	4.460	0.999	0.202	3.302	0.911
TIF-1 Zn	0.199	2.760	0.998	0.131	3.170	0.951

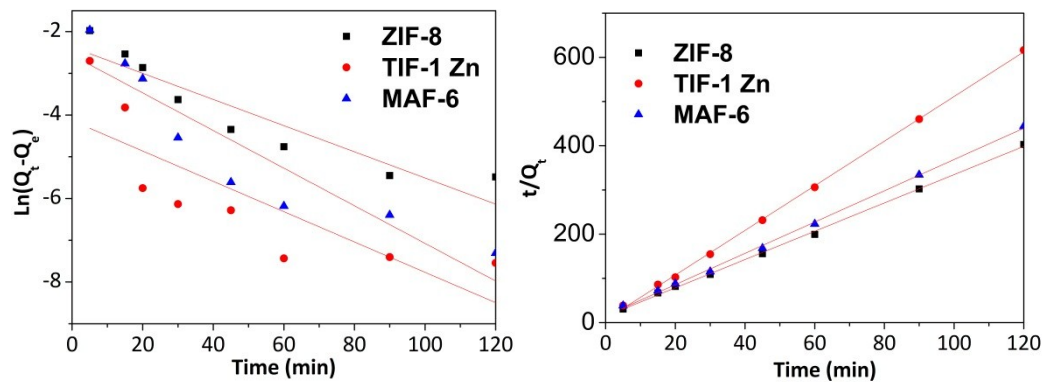


Figure S4 (Left) The pseudo-first-order and (Right) pseudo-second-order kinetic model of 1-butanol onto the three hydrophobic ZIFs at 25°C.

Table S2 The kinetic parameters for adsorption of 1-butanol onto the three hydrophobic ZIFs at 25 °C.

Adsorbent	Pseudo-first-order kinetic model			Pseudo-second-order kinetic model			
	K_1	$Q_{e,cal} (g/g)$	R_1^2	$K_2 (g/g \cdot min)$	$Q_{e,exp}(g/g)$	$Q_{e,cal}(g/g)$	R_2^2
ZIF-8	0.031	0.093	0.853	0.706	0.294	0.302	0.999
MAF-6	0.045	0.077	0.833	0.822	0.282	0.275	0.998
TIF-1 Zn	0.036	0.016	0.610	3.860	0.198	0.194	0.999

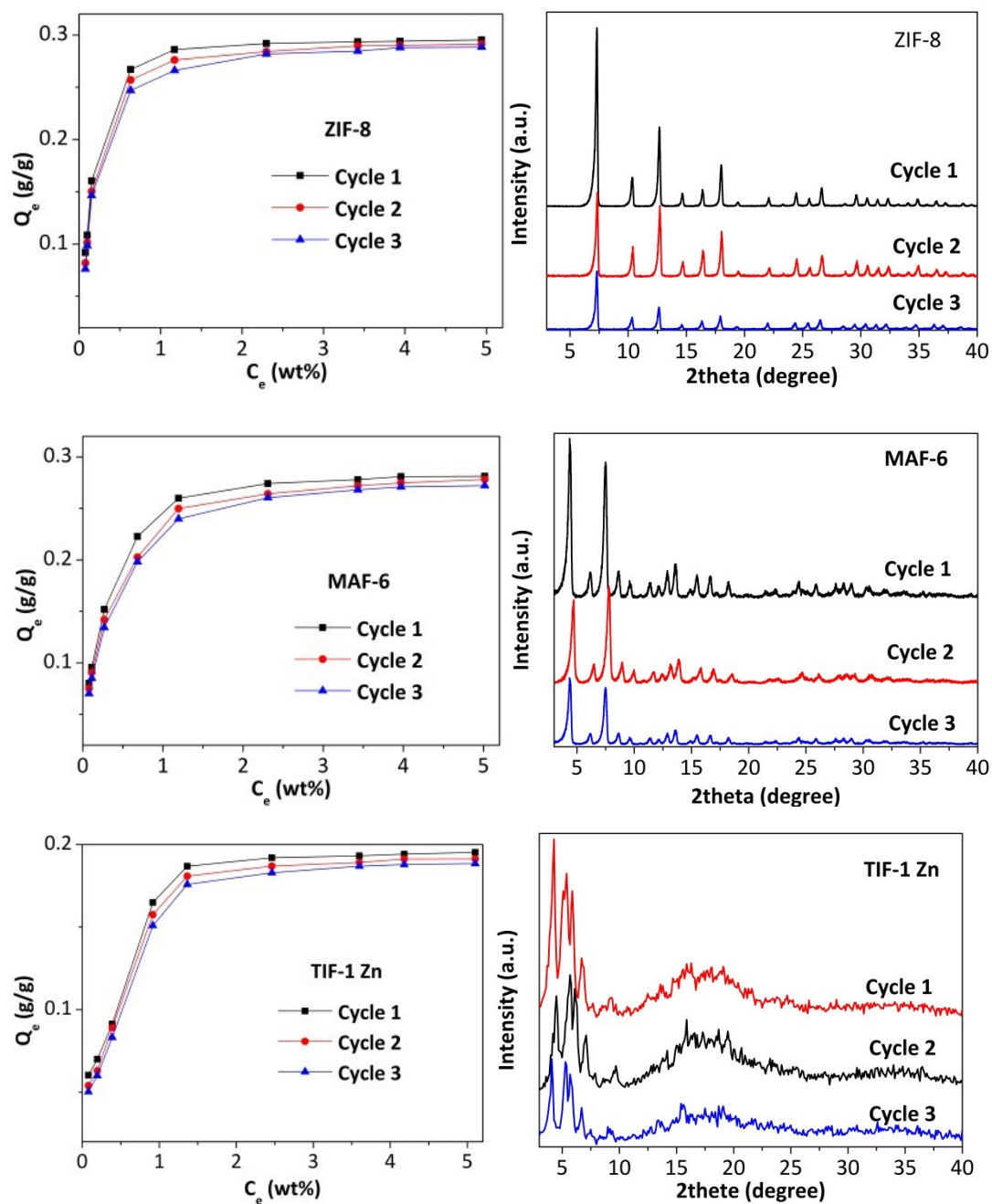


Figure S5 (Left) Cycle curves for 1-butanol adsorption isotherm onto the three hydrophobic materials (Right) show PXRD of ZIFs materials before and after adsorption at 25 °C and the sample was regenerated for 2h at 250 °C.

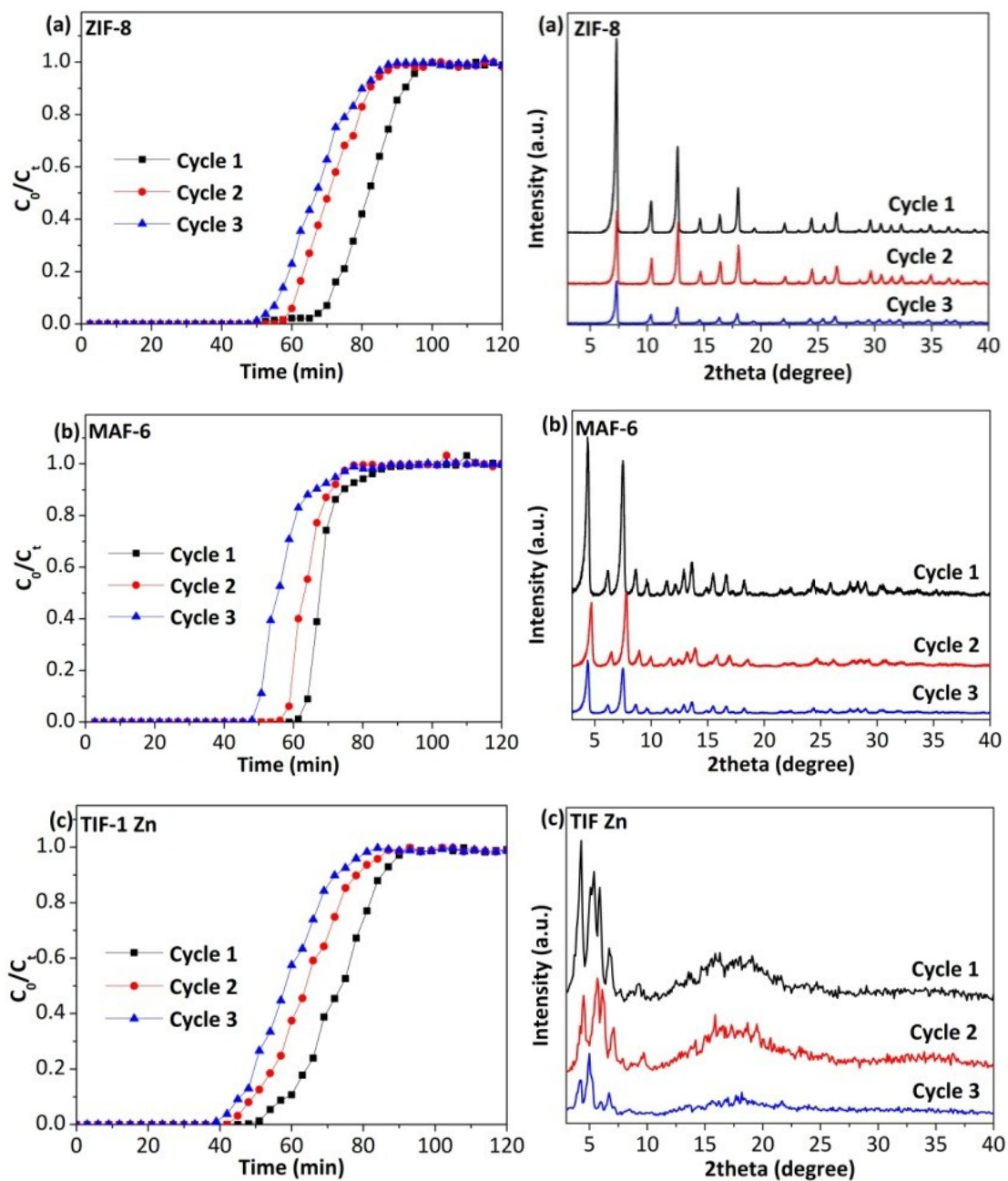


Figure S6 (Left) Cycle curves for 1-butanol breakthrough onto ZIF-8, MAF-6 and TIF-1 Zn packed column and (Right) show PXRD of ZIFs materials before and after adsorption at 25 °C and the sample was regenerated for 2h at 250 °C.

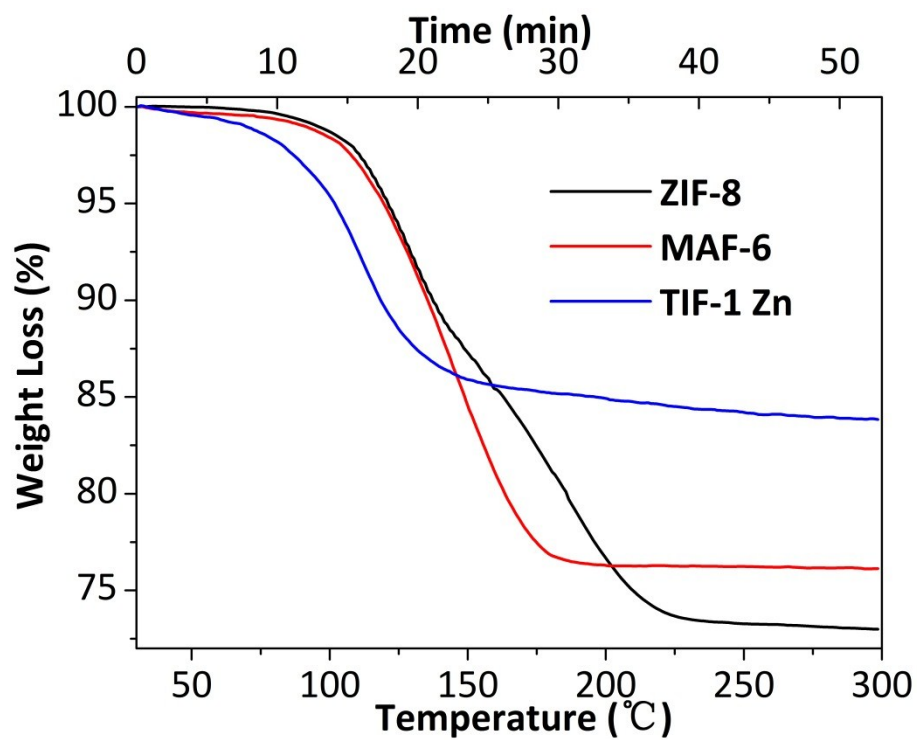


Figure S7 The 1-butanol desorption data of three hydrophobic materials-ZIF-8, MAF-6 and TIF-1 Zn.