Supporting Information

One-pot synthesis of UiO-66@SiO_2 shell-core microspheres as stationary phase for high performance liquid chromatography

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ultrasonic for 10 min in a dichloromethane solution.

Fig. S6: Effect of the flow rate on the column backpressure on UiO-66@SiO_2-0.16 packed column.

Fig. S7. Chromatograms of the separation of (A) xylenes and ethylbenzene, (B) alkyl benzenes, (C) anilines and (D) substituted benzenes on UiO-66@SiO_2-0.16 packed column with different ratio of ACN/H_2O as mobile phase. Other separation conditions are identical to Fig. 6.

Fig. S8. Chromatograms on commercial C18 column for the separation of four groups of analytes: (A) xylenes and ethylbenzene; mobile phase, 50% ACN; (B) alkyl benzenes; mobile phase, 70% ACN; (C) anilines; mobile phase, 50% ACN; (D) substituted benzenes; mobile phase, 50% ACN. Other separation conditions are identical to Fig. 6.

Fig. S9: Chromatograms of PAHs on UiO-66@SiO_2-0.16 packed column with 20% ACN as mobile phase at a flow rate of 1.0 mL min^{-1}. The signals were monitored with a UV detector at 254 nm.

Fig. S10: Chromatograms of phenolic compounds on (A) UiO-66@SiO_2-0.16 packed column and (B) aminosilica packed column with different ratio of ACN/H_2O as mobile phase at a flow rate of 1.0 mL min^{-1}. The signals were monitored with a UV detector at 270 nm.

Table S1 The synthesis conditions for different UiO-66@SiO_2 composites. [a]

Sample name	$ZrCl_4$ (g)	H_2BDC (g)	Acetic acid (mL)	Temperature (^oC)	Time (h)
UiO-66@SiO_2-0.08	0.08	0.057	0.5	120	24
UiO-66@SiO_2-0.16	0.16	0.114	1.0	120	24
UiO-66@SiO_2-0.32	0.32	0.228	2.0	120	24
UiO-66@SiO_2-0.64	0.64	0.456	4.0	120	24
UiO-66@SiO_2-1.28	1.28	0.912	8.0	120	24
UiO-66@SiO_2-2.56	2.56	1.824	16.0	120	24
85 ^{o}C	0.64	0.456	4.0	85	24
100 ^{o}C	0.64	0.456	4.0	100	24
110 ^{o}C	0.64	0.456	4.0	110	24
3 h	0.64	0.456	4.0	120	3
6 h	0.64	0.456	4.0	120	6
12 h	0.64	0.456	4.0	120	12

[a]The synthesis of the UiO-66@SiO_2 composites was identical to what was described in experimental section.

Table S2 The retention time (t_r) and retention factors (k) of aniline compounds on the UiO-66@SiO_2 packed columns with different loading amount of UiO-66 shell.[a]

Column	p-phenylenediamine		aniline		N,N-dimethylaniline		p-chloroaniline	
	t_r (min)	k	t_r (min)	k	t_r (min)	k	t_r (min)	k
UiO-66@SiO_2-0.16	2.071	0.126	2.657	0.319	3.225	0.439	4.397	0.588
UiO-66@SiO_2-0.32	1.331	0.047	1.635	0.224	2.151	0.410	5.366	0.764
UiO-66@SiO_2-0.64	1.624	0.158	2.647	0.484	3.846	0.645	6.526	0.791

[a]Experimental conditions were identical to Fig. 8.

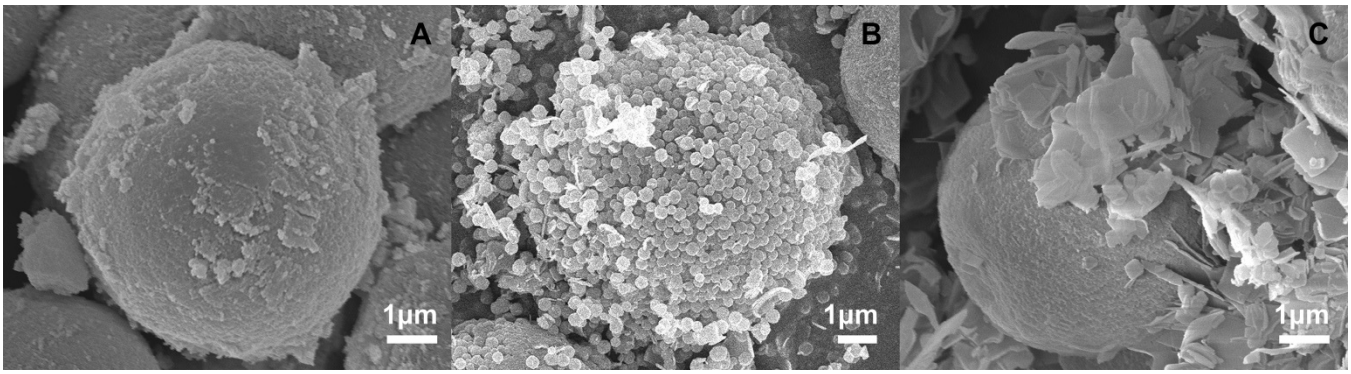


Fig. S1. SEM images of (A) UiO-66@SiO_2-0.08; (B) UiO-66@SiO_2-1.28; (C) UiO-66@SiO_2-2.56.

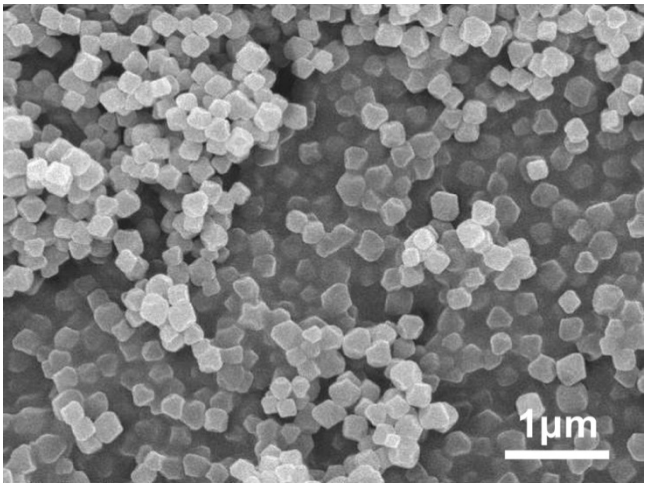


Fig. S2. SEM image of UiO-66.

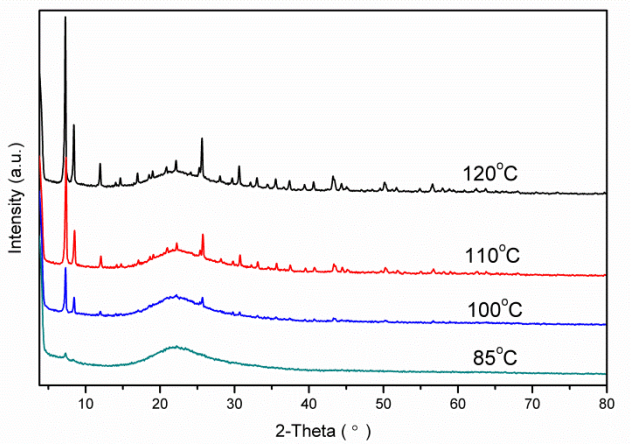


Fig. S3. XRD patterns of UiO-66@SiO_2 composites prepared at 85°C, 100°C, 110°C and 120°C for 24 h. It can be seen that the signal intensity of the characteristic peaks of UiO-66 increases with the reaction temperature.

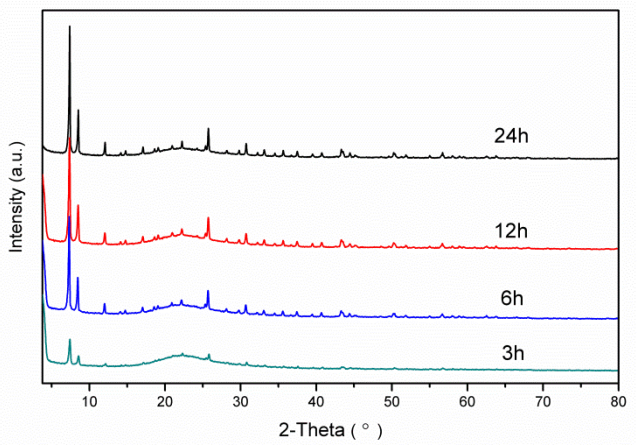


Fig. S4. XRD patterns of UiO-66@SiO_2 composites prepared at 120°C for 3 h, 6 h, 12 h and 24 h. It can be seen that the signal intensity of the characteristic peaks of UiO-66 increases with the reaction time.

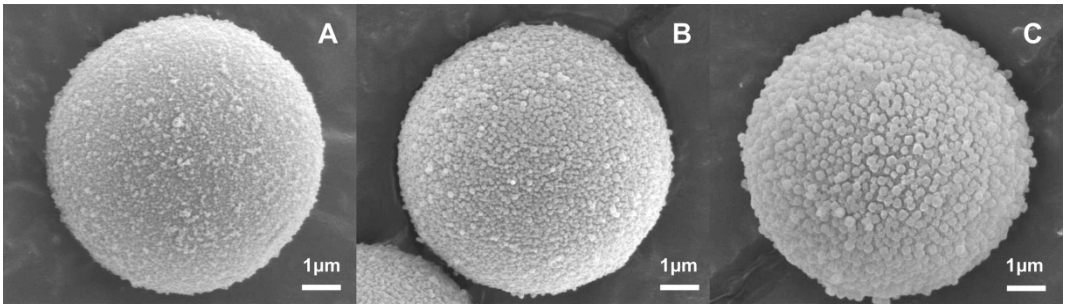


Fig. S5. SEM images of (A) UiO-66@SiO_2-0.16; (B) UiO-66@SiO_2-0.32; (C) UiO-66@SiO_2-0.64 after ultrasonic for 10 min in a dichloromethane solution.

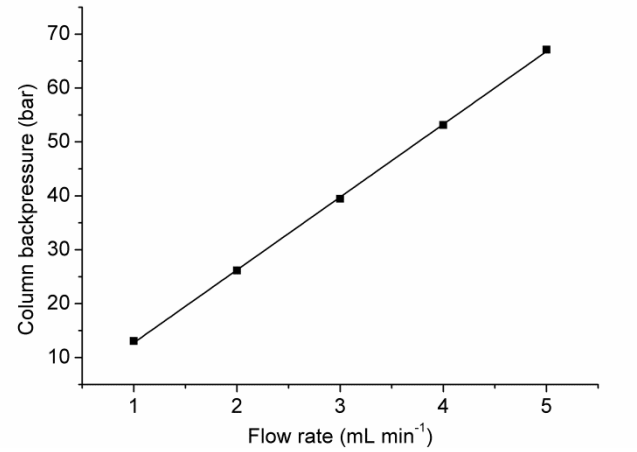
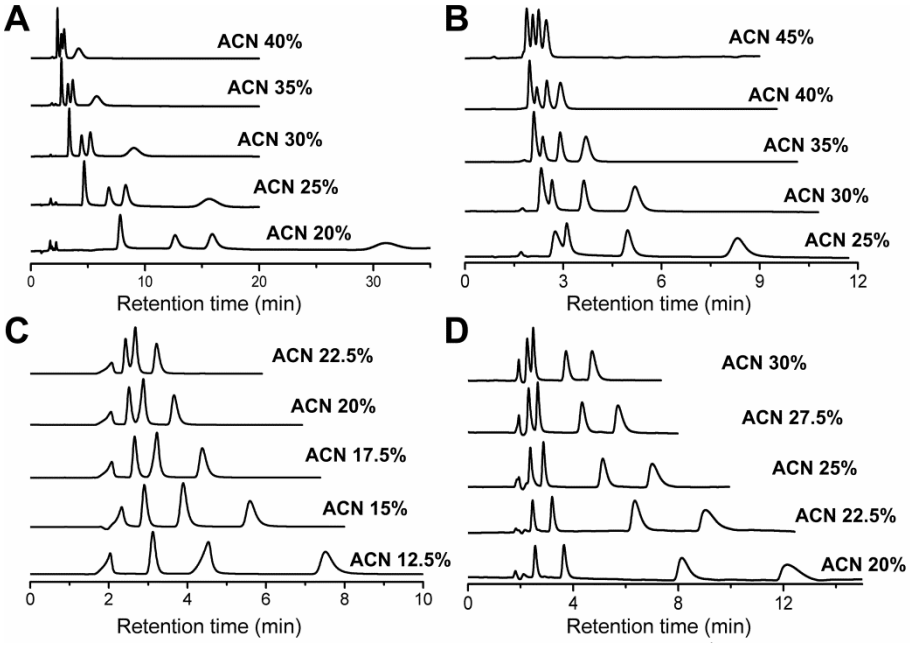


Fig. S6. Effect of the flow rate on the column backpressure on UiO-66@SiO_2-0.16 packed column. 100% ACN was used as mobile phase.



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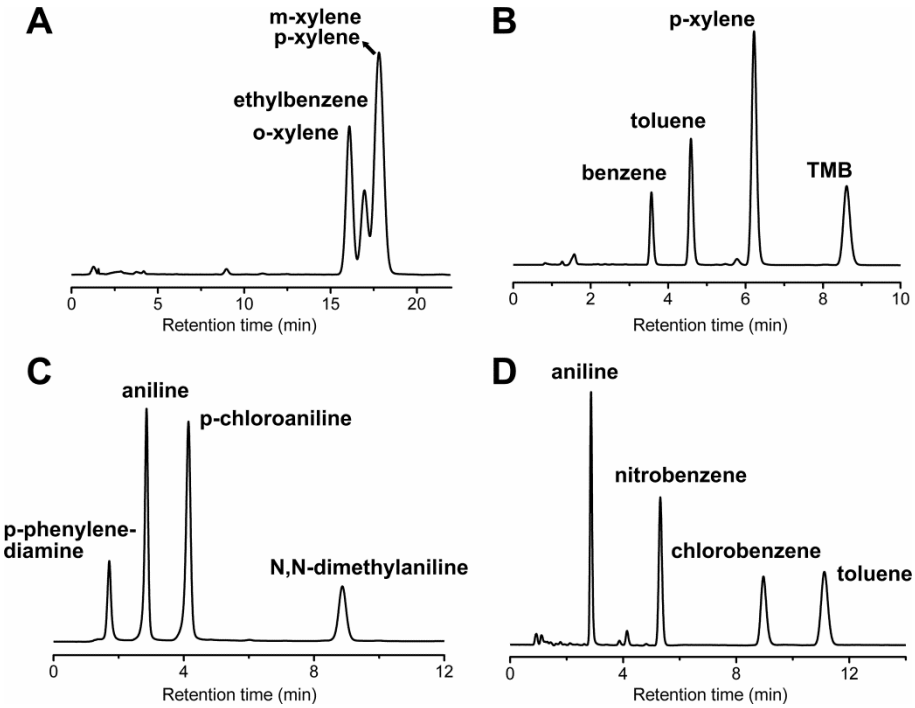

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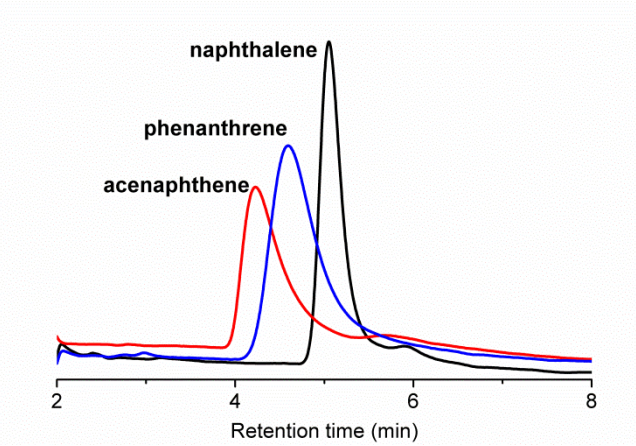

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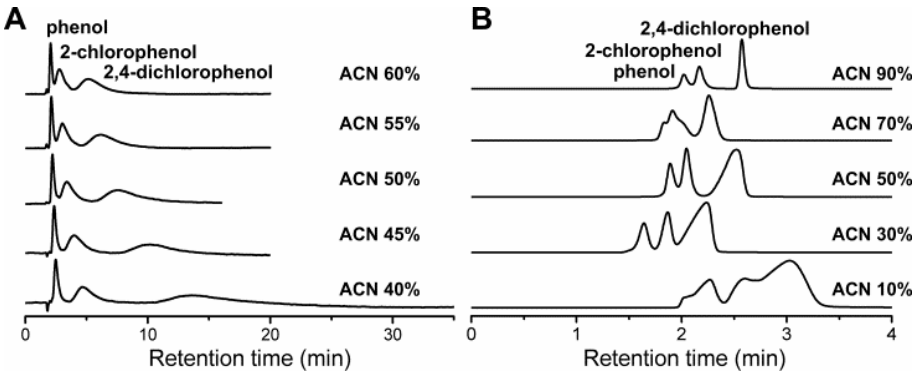

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