Electronic Supplementary Material (ESI) for Analytical Methods.

Supplementary Information

Preparation, characterization and evaluation of imidazolium ionic liquid polymer stationary phase for mixed-mode chromatography

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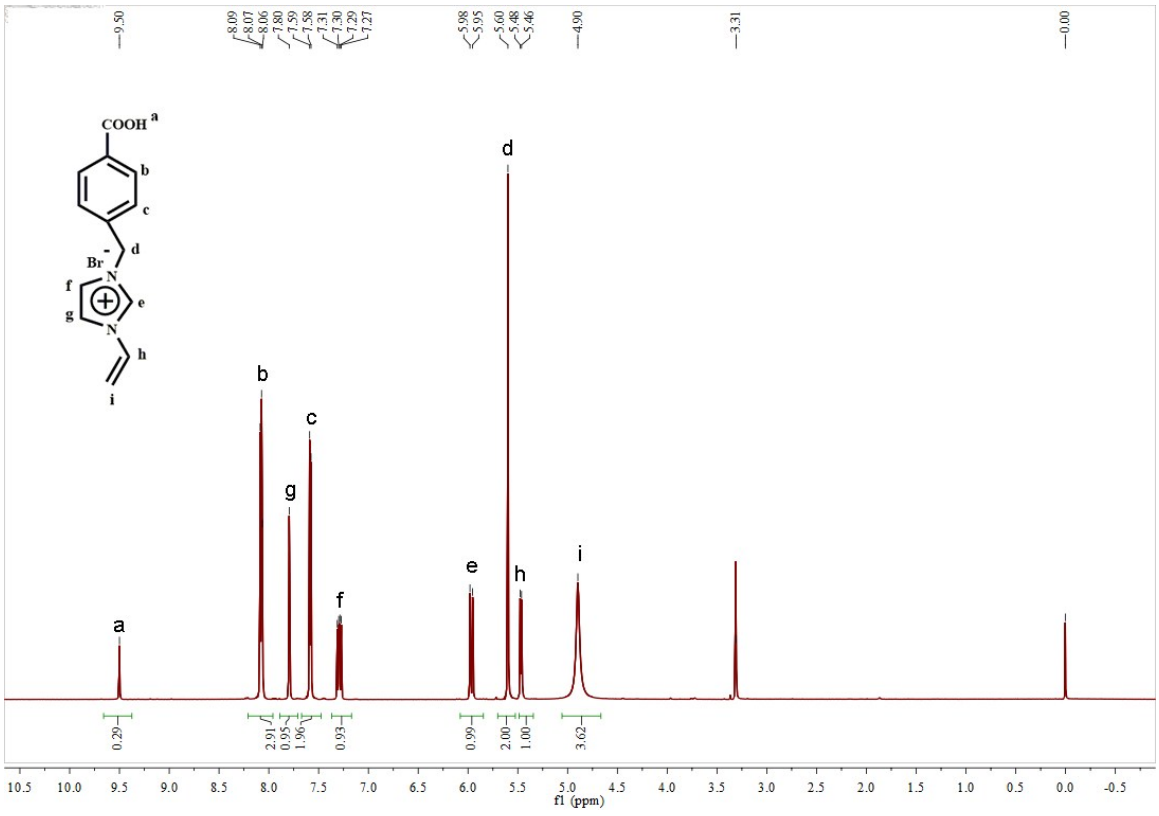


Fig. S1 The ^{1}H NMR of Imidazolium IL

^{1}H NMR (600 MHz, MeOD) δ 9.50 (s, 1H), 8.21-7.96 (m, 3H), 7.80 (s, 1H), 7.58 (d, J = 8.2 Hz, 2H), 7.29 (dd, J = 15.6, 8.7 Hz, 1H), 5.97 (d, J = 15.6 Hz, 1H), 5.60 (s, 2H), 5.47 (d, J = 8.7 Hz, 1H), 4.90 (s, 4H).

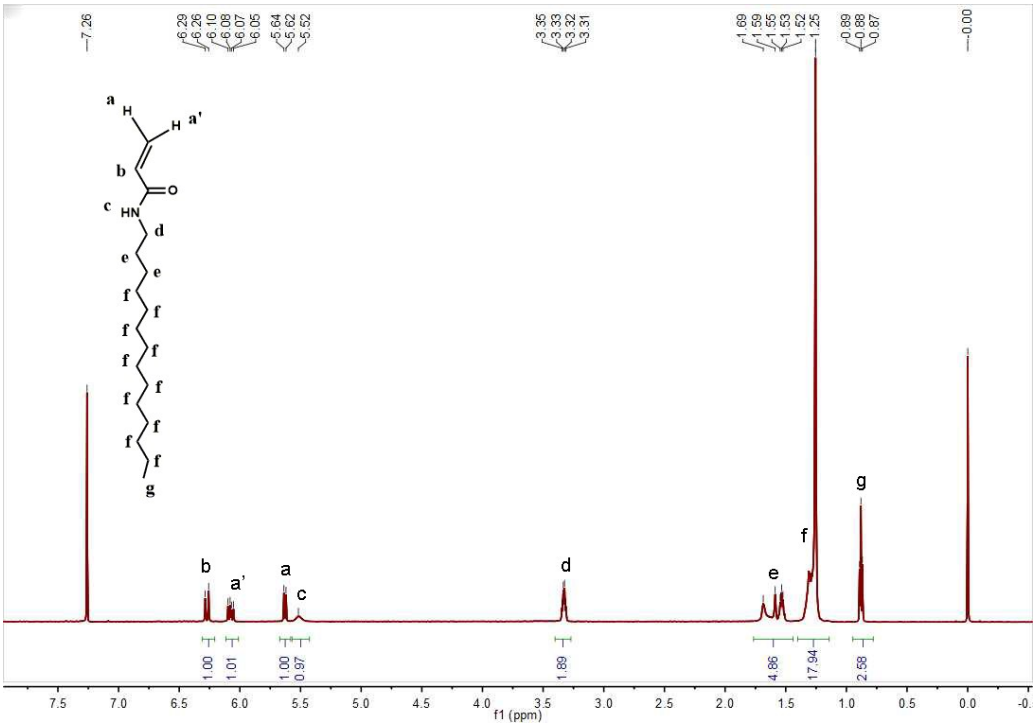


Fig. S2 The ^{1}H NMR of N-tetradecyl acrylamide

^{1}H NMR (600 MHz, $CDCl_3$) δ 6.27 (d, J = 17.0 Hz, 1H), 6.08 (dd, J = 16.8, 10.3 Hz, 1H), 5.63 (d, J = 10.4 Hz, 1H), 5.52 (s, 1H), 3.33 (dd, J = 13.1, 6.9 Hz, 2H), 1.77-1.44 (m, 5H), 1.25 (s, 18H), 0.88 (t, J = 7.0 Hz, 3H).

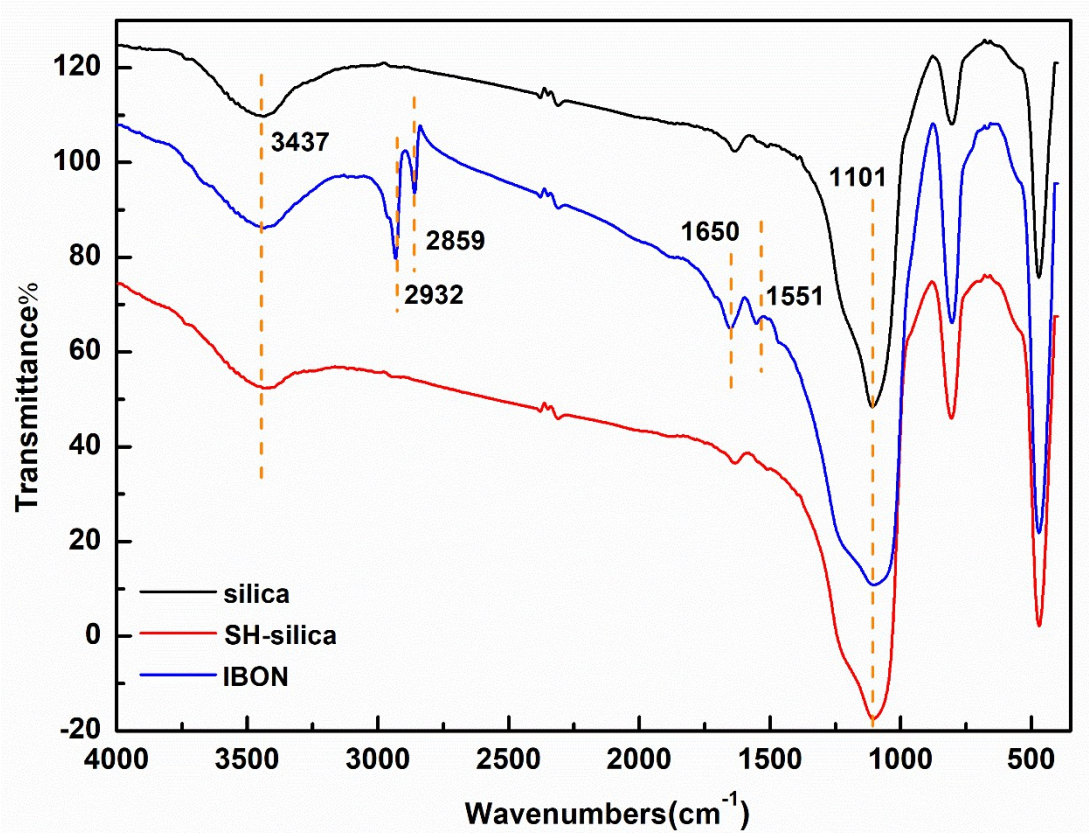
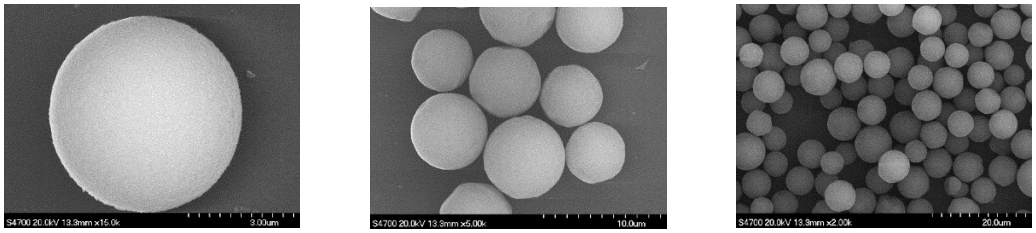


Fig. S3 FT-IR spectroscopy of silica, SH-silica and IBON stationary phase

(A) Silica



(B) IBON materials

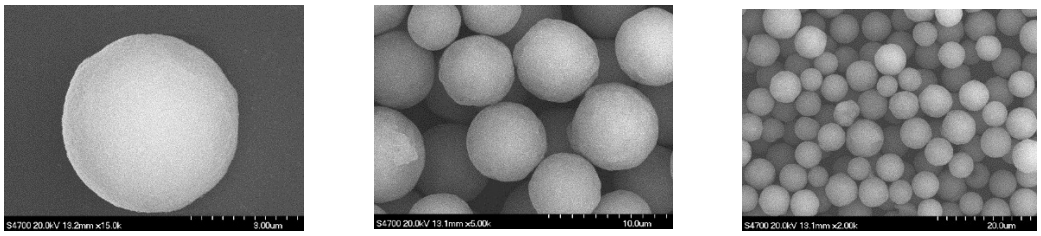


Fig. S4 SEM images of (A) Silica and (B) IBON material

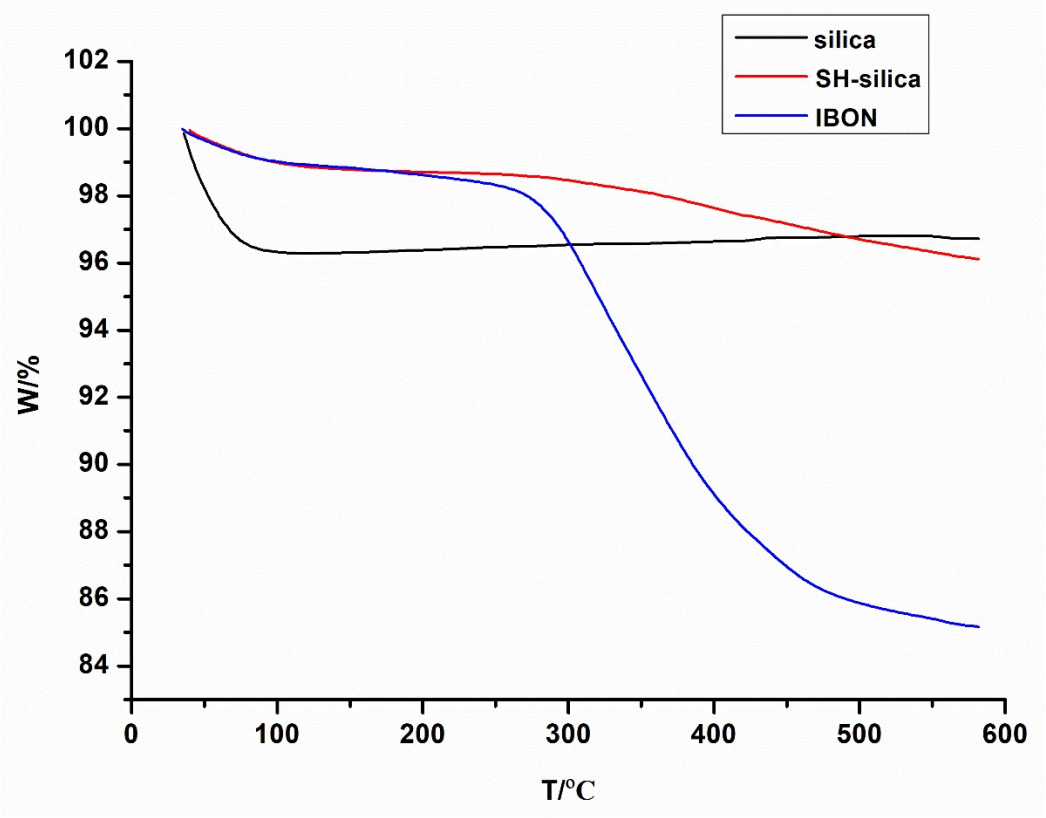


Fig. S5 Thermogravimetric curves of silica, SH-silica and IBON stationary phase

Table S1 Element analysis results of silica, SH-silica and IBON material

Stationary phase	C [%]	H [%]	N [%]	S [%]
silica	0.54	1.01	0	0.14
SH-silica	1.54	1.03	0	0.29
IBON	11.12	2.31	0.92	0.28

Table S2 Parameters of ln k and 1/T based on Van't Hoff equation for tested solutes

Test solutes	ΔH (kJ/mol)	ΔS (J/mol K)	R^2_{adj}
Benzoic acid	-8.71	-23.41	0.995
3-Ntrobenzoic acid	-2.73	2.15	0.735
p-Ntrobenzoic acid	-4.03	-1.03	0.778
Melamine	-11.69	-38.72	0.987
Cytidine	-16.34	-42.89	0.998
Adenosine	-14.99	-49.71	0.987
Pyridine	-13.73	-56.41	0.952
Uracil	-10.64	-44.01	0.966

Table S3 Reproducibility of retention factor on IBON columns. Conditions: ACN/H_2O = 95/5 (v/v) containing 5 mM NH_4FA; ${}^{w}_{w}pH$: 4.0; column temperature: 25 °C; 0.8 mL min^{-1}; DAD: 254 nm. The batch-to-batch (n=3) method was that the stationary phases were prepared in three batches and packed into three columns. The RSD% of time-to-time was determined by using the same column.

	Retention factor (RSD%)	
Analytes	Batch to batch (n=3)	Time to time (n=15)
Toluene	2.16	0.28
Uridine	3.62	0.44
Cytidine	6.81	0.72

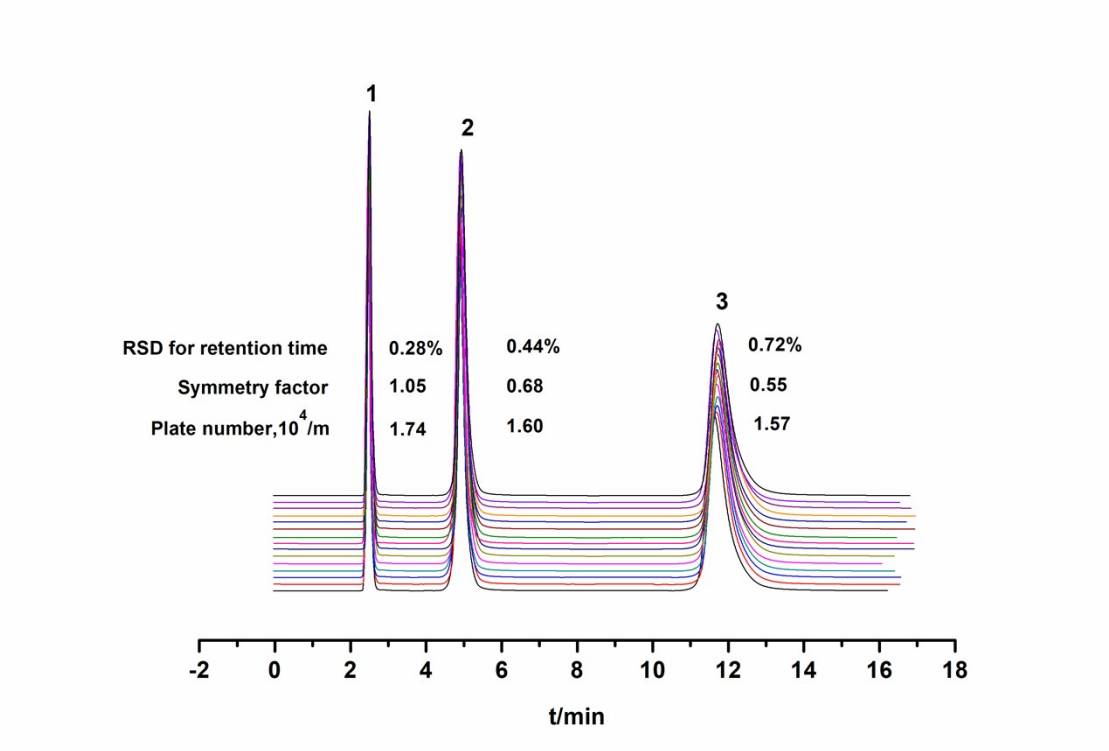


Fig. S6 Column efficiency and retention repeatability of IBON.
Analytes: 1. toluene, 2. uridine, 3. cytidine. Conditions: ACN/H_2O = 95/5 (v/v) containing 5 mM NH_4FA; ${}^{w}_{w}pH$: 4.0; column temperature: 25 °C; 0.8 mL min^{-1}; DAD: 254 nm.