SUPPORTING INFORMATION

ION CONDUCTING ROMP MONOMERS BASED ON (OXA)NORBORNENES WITH PENDANT IMIDAZOLIUM SALTS CONNECTED VIA OLIGO(OXYETHYLENE) UNITS AND WITH OLIGO(ETHYLENEOXY) TERMINAL MOIETIES

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***Exo,Exo*-Bis(2-(2'-(2''-hydroxyethoxy)ethoxy)ethyl) bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylate {NB[C(O)OE$_2$OH]$_2$, 2b}**: General procedure 1 was used to produce a clear oil (3.82 g, 70 %) by using: **1** (2.00 g, 12.2 mmol), tri(ethylene glycol) (50 mL, 374 mmol), and sulfuric acid (0.1 mL, 2 mmol). ^{1}H NMR (500 MHz, CDCl$_3$) δ: 6.21 (s, 2H), 4.23 (m, 4H), 3.79–3.57 (m, 20H), 3.11 (s, 2H), 2.66 (m, 2H), 2.10 (m, 1H), 1.49 (m, 1H). ^{13}C NMR (126 MHz, CDCl$_3$) δ: 173.56, 137.98, 72.62, 70.56, 70.37, 69.07, 63.75, 61.78, 47.27, 45.75, 45.40 (11 signals expected and 11 signals found). HR MS: calc. for C$_{21}$H$_{35}$O$_{10}$ [M + H]$^+$: m/z 447.2225; found: m/z 447.2214 (error –2.3 ppm); calc. for C$_{21}$H$_{34}$O$_{10}$Na [M + Na]$^+$: m/z 469.2044; found: m/z 469.2041 (error 0.6 ppm).

***Exo,Exo*-Bis(2-(2'-(2''-(2'''-hydroxyethoxy)ethoxy)ethoxy)ethyl) bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylate {NB[C(O)OE$_4$OH]$_2$, 2c}**: General procedure 1 was used to

produce a clear oil (25.3 g, 63 %) by using: **1** (12.3 g, 74.8 mmol), tetra(ethylene glycol) (400 mL, 2.32 mol), and sulfuric acid (0.30 mL, 5.6 mmol). ^{1}H NMR (500 MHz, $CDCl_3$) δ: 6.21 (s, 2H), 4.27 (m, 2H), 4.15 (m, 2H), 3.77 – 3.55 (m, 28H), 3.10 (s, 2H), 2.65 (s, 2H), 2.09 (m, 1H), 1.49 (m, 1H). ^{13}C NMR (126 MHz, $CDCl_3$) δ: 173.53, 137.98, 72.57, 70.67, 70.57, 70.52, 70.38, 69.11, 63.82, 61.75, 47.25, 45.76, 45.37 (13 signals expected and 13 signals found). HR MS: calc. for $C_{25}H_{43}O_{12}$ $[M + H]^+$: m/z 535.2749; found: m/z 535.2760 (error 2.1 ppm).

***Exo,Exo*-Bis(2-(2'-(2''-tosyloxyethoxy)ethoxy)ethyl) bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylate {NB[C(O)OE$_3$OTs]$_2$, 3b}**: General procedure 2 was used to produce a clear oil (4.13 g, 43%) by using: **2b** (5.68 g, 12.7 mmol), TEA (7.0 mL, 50 mmol), DCM (25 mL), and tosyl chloride (7.32 g, 38.4 mmol) in DCM (80 mL). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.79 (d, *J* = 8 Hz, 4H), 7.34 (d, *J* = 8 Hz, 4H), 6.20 (m, 2H), 4.25 (m, 2H), 4.18–4.14 (m, 4H), 4.09 (m, 2H), 3.71 – 3.62 (m, 8H), 3.58 (s, 8H), 3.09 (m, 2H), 2.64 (s, 2H), 2.45 (s, 6H), 2.07 (d, *J* = 9 Hz, 1H), 1.47 (d, *J* = 9 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ: 173.47, 144.82, 137.94, 133.03, 129.84, 127.97, 70.73, 70.45, 69.22, 69.10, 68.74, 63.73, 47.25, 45.76, 45.34, 21.64 (16 peaks expected and 16 peaks found). High res MS: calc. for $C_{35}H_{47}O_{14}S_2$ $[M + H]^+$: m/z 755.2402; found: m/z 755.2410 (error 1 ppm); calc. for $C_{35}H_{50}O_{14}S_2N$ $[M + NH_4]^+$: m/z 772.2667; found: m/z 772.2688 (error 2.7 ppm); calc. for $C_{35}H_{46}O_{14}S_2Na$ $[M + Na]^+$: m/z 755.2221; found: m/z 772.2239 (error 2.3 ppm); calc. for $C_{35}H_{46}O_{14}S_2K$ $[M + K]^+$: m/z 793.1961; found: m/z 793.2040 (error 10 ppm).

***Exo,Exo*-Bis(2-(2'-(2''-(2'''-tosyloxyethoxy)ethoxy)ethoxy)ethyl) bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylate {NB[C(O)OE$_4$OTs]$_2$, 3c}**: General procedure 2 was used to produce a clear oil (5.02 g, 47%) by using: **2c** (6.72 g, 12.6 mmol), TEA (7.00 mL, 50.2 mmol), DCM (20 mL) and tosyl chloride (7.06 g, 37.0 mmol) in DCM (80 mL). ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.80 (d, *J* = 8 Hz, 4H), 7.34 (d, *J* = 8 Hz, 4H), 6.22–6.18 (m, 2H), 4.27 (m, 2H), 4.18–4.14 (m, 4H), 4.10 (m, 2H), 3.71–3.57 (m, 24H), 3.09 (s, 2H), 2.64 (d, 2H), 2.45 (s, 6H), 2.08 (d, *J* = 9 Hz, 1H), 1.47 (d, *J* = 9 Hz, 1H). ^{13}C NMR (126 MHz, $CDCl_3$) δ: 173.49, 144.82, 137.95, 132.99, 129.84, 127.97, 70.74, 70.59, 70.53, 70.49, 69.25, 69.05, 68.69, 63.76, 47.22, 45.74, 45.33, 21.65 (18 peaks expected and 18 peaks found). HR MS: calc. for $C_{39}H_{55}O_{16}S_2$ $[M + H]^+$: m/z 843.2926; found: m/z 843.2937 (error 1.4 ppm); calc. for $C_{39}H_{58}O_{16}S_2$ $[M + NH_4]^+$: m/z 860.3192; found: m/z 860.3205 (error 1.6 ppm); calc. for $C_{39}H_{54}O_{16}S_2Na$ $[M + Na]^+$: m/z 865.2745; found: m/z 865.2755 (error 1.1 ppm); calc. for $C_{39}H_{55}O_{16}S_2K$ $[M + K]^+$: m/z 881.2485; found: m/z 881.2502 (error 2.0 ppm).

***Exo,Exo*-Bis(2-(2'-(2''-(2'''-(2''''-(2'''''-tosyloxyethoxy)ethoxy)ethoxy)ethoxy)ethoxy)-ethyl) bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylate {NB[C(O)OE$_6$OTs]$_2$, 3e}:** General procedure 4 was used to produce a liquid (2.79 g, 82%) by using: **1** (0.37 g, 2.3 mmol), hexa(ethylene glycol) monotosylate (2.04 g, 4.67 mmol), EDCI (0.87 g, 5.6 mmol), DMAP (0.14 g, 1.1 mmol), and DCM (50 mL). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.80 (d, *J* = 8 Hz, 4H), 7.35 (d, *J* = 8 Hz, 4H), 6.20 (s, 2H), 4.32–4.24 (m, 2H), 4.19–4.13 (m, 4H), 4.13–4.06 (m, 2H), 3.80–3.53 (m, 40H), 3.09 (s, 2H), 2.64 (d, *J* = 2 Hz, 2H), 2.45 (s, 6H), 2.08 (d, *J* = 9 Hz, 1H), 1.48 (d, *J* = 9

Hz, 1H). ^{13}C NMR (126 MHz, $CDCl_3$) δ 173.47, 144.78, 137.95, 133.02, 129.82, 127.98, 72.49, 70.75, 70.61, 70.57, 70.52, 70.34, 69.24, 69.06, 68.68, 63.76, 61.75, 47.22, 45.75, 45.34, 42.73, 21.65 (22 signals expected and 22 found). HR MS: calc. for $C_{47}H_{74}O_{20}S_2N$ $[M + NH_4]^+$: m/z 1036.4246; found: m/z 1036.4303 (error –5.5 ppm); calc. for $C_{47}H_{70}O_{20}S_2Na$ $[M + Na]^+$: m/z 1041.3800; found: m/z 1041.3864 (error –6.1 ppm).

Tetra(ethylene glycol) monomethyl ether monotosylate ($MeOE_4OTs$, 5c): Tetra(ethylene glycol) monomethyl ether (5.02 g, 24.1 mmol) and THF (1 mL) were combined in a round bottom flask and cooled to 0°C. In a separate container sodium hydroxide (1.02 g, 25.5 mmol) was dissolved in water (1 mL) and added to the glycol solution. Tosyl chloride (4.89 g, 25.6 mmol) dissolved in THF (20 mL) was added dropwise to the reaction mixture. After the tosyl chloride addition was complete, the solution was allowed to warm to room temperature and stirred for 24 h. The organic layer was collected and the aqueous layer was extracted with ether twice. The organic layers were combined and washed with 10% wt sodium hydroxide (x 3), water (x 2), saturated NaCl (x 1), and dried over sodium sulfate. Filtration and removal of the solvent provided the desired product as an oil: 6.41 g (73%). ^1H NMR (500 MHz, $CDCl_3$) δ 7.80 (d, J = 8 Hz, 2H), 7.34 (d, J = 8 Hz, 2H), 4.19 – 4.12 (m, 2H), 3.71 – 3.66 (m, 2H), 3.66 – 3.61 (m, 6H), 3.59 (s, 4H), 3.56 – 3.52 (m, 2H), 3.38 (s, 3H), 2.45 (s, 3H). ^{13}C NMR (126 MHz, $CDCl_3$) δ 144.79), 133.01, 129.82, 127.99, 71.93, 70.74, 70.60, 70.59, 70.52, 69.24, 68.68, 59.04, 21.65 (14 peaks expected and 13 peaks found; 2 peaks are believed to be overlapping at 70.52). High res MS: calc. for $C_{16}H_{27}O_7S$ $[M + H]^+$: m/z

363.1477; found: m/z 363.1490 (error 3.6 ppm); calc. for $C_{16}H_{30}O_7SN$ [M + NH_4]$^+$: m/z 380.1743; found: m/z 380.1754 (error 2.9 ppm).

Hexa(ethylene glycol) Monotosylate, HOE_6OTs: General Procedure 3 was used to produce a liquid (8.32 g, 24 %) by using; hexa(ethylene glycol) (22.47 g, 79.59 mmol), tosyl chloride (15.34 g, 80.46 mmol), NaOH (3.20 g, 80.0 mmol), water (10 mL), and THF (40 mL). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.80 (d, *J* = 8 Hz, 2H), 7.35 (d, *J* = 8 Hz, 2H), 4.19–4.13 (m, 2H), 3.75–3.56 (m, 22H), 2.45 (s, 3H). ^{13}C NMR (126 MHz, $CDCl_3$) δ 144.77, 132.99, 129.81, 127.96, 72.48, 70.71, 70.59, 70.55, 70.53, 70.52, 70.50, 70.31, 69.26, 68.66, 61.71, 21.63 (17 signals expected and 16 signals found; peak @ 70.59 results from the overlapping of 2 peaks). HR MS: calc. for $C_{19}H_{32}O_9SNa$ [M + Na]$^+$: m/z 459.1665; found: m/z 459.1661 (error –0.9 ppm); calc. for $C_{19}H_{33}O_9S$ [M + H]$^+$: m/z 437.1845; found: m/z 437.1837 (error 2 ppm); calc. for $C_{19}H_{32}O_9SK$ [M + K]$^+$: m/z 475.1404; found: m/z 475.1395 (error 2 ppm).

1-(2'-Methoxyethyl)imidazole (ImEOMe, 6b): General procedure 5 was used to produce a yellow tinted liquid (1.08 g, 86 %) by using: imidazole (1.36 g, 20 mmol), sodium hydroxide (0.72 g, 18 mmol), water (25 mL), and 2-chloroethyl methyl ether (0.945 g, 10 mmol) in THF (25 mL). ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.52 (s, 1H), 7.05 (s, 1H), 6.97 (s, 1H), 4.09 (t, *J* = 5 Hz, 2H), 3.63 (t, *J* = 5 Hz, 2H), 3.34 (s, 3H). ^{13}C NMR (126 MHz, $CDCl_3$) δ: 137.49, 129.30, 119.38, 71.84, 59.02, 47.03 (6 signals expected and 6 signals found). HR MS: calc. for $C_6H_{11}N_2O$ [M + H]$^+$: m/z 127.0866; found: m/z 127.0866 (error 0 ppm).

1-(2'-Methoxyethyl)imidazole ($ImEO_2Me$, 6c): The literature procedure [S1] afforded a

yellow liquid (71 %) whose ^{1}H and ^{13}C NMR spectra matched the literature report. HR MS: calc. for $C_8H_{15}N_2O_2$ $[M + H]^+$: m/z 171.1134; found: m/z 171.1129 (error 2.9 ppm).

1-(2'-(2''-(2'''-Methoxyethoxy)ethoxy)ethyl)imidazole ($ImEO_3Me$, 6d): General procedure 5 was used to produce a clear oil (6.76 g, 76 %) by using: imidazole (2.83 g, 41.6 mmol), sodium hydroxide (1.88 g, 47.0 mmol), water (3 mL), and **5b** (14.38 g, 45.17 mmol) in THF (20 mL). ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.53 (s, 1H), 7.04 (s, 1H), 6.99 (s, 1H), 4.11 (t, *J* = 5 Hz, 2H), 3.77–3.72 (m, 2H), 3.64–3.58 (m, 6H), 3.56–3.52 (m, 2H), 3.38 (s, 3H); this closely matched the literature report.[S2] ^{13}C NMR (126 MHz, $CDCl_3$) δ: 137.56, 129.27, 119.41, 71.94, 70.72, 70.61, 70.59, 70.56, 59.05, 47.05 (10 signals expected and 10 signals found). HR MS: calc. for $C_{10}H_{19}O_3N_2$ $[M + H]^+$: m/z 215.1390; found: m/z 215.1397 (error 3 ppm).

1-(2',5',8',11'-Tetraoxatridecan-13'-yl)imidazole ($ImEO_4Me$, 6e): General procedure 5 was used to produce a clear oil (4.32 g, 94 %) by using: imidazole (2.76 g, 40.5 mmol), sodium hydroxide (1.53 g, 38.3 mmol), water (5 mL) and **5c** (6.46 g, 17.8 mmol) in THF (60 mL). ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.53 (s, 1H), 7.04 (s, 1H), 7.00 (s, 1H), 4.11 (t, *J* = 5 Hz, 2H), 3.74 (t, *J* = 5 Hz, 2H), 3.69–3.53 (m, 12H), 3.37 (s, 3H). ^{13}C NMR (126 MHz, $CDCl_3$) δ: 137.52, 129.24, 119.40, 71.93, 70.70, 70.61, 70.56, 70.54, 70.52, 59.00, 47.03 (12 signals expected and 11 signals found; it is believed that two peaks overlap at 70.61). HR MS: calc. for $C_{12}H_{23}O_4N_2$ $[M + H]^+$: m/z 259.1652; found: m/z 259.1665 (error 5.0 ppm).

***Exo,Exo*-NB[C(O)OEIm$^+$EOMe]$_2$ (TFSI$^-$)$_2$ (8b):** General procedure 6 was used to produce an oil (4.85 g, 52 %) by using: **4** (3.55g, 8.96 mmol), **6b** (4.42 g, 35.0 mmol)

and LiTFSI (6.20 g, 21.6 mmol). ^{1}H NMR (400 MHz, DMSO-d_6) δ 9.12 (t, J = 2 Hz, 2H), 7.73 (dt, J = 4, 2 Hz, 4H), 6.19 (t, J = 2 Hz, 2H), 4.48–4.36 (m, 6H), 4.36–4.31 (m, 4H), 4.22–4.12 (m, 2H), 3.68–3.61 (m, 4H), 3.22 (s, 6H), 2.92–2.88 (m, 2H), 2.58 (d, J = 2 Hz, 2H), 1.67 (d, J = 9 Hz, 1H), 1.28 (dt, J = 9, 2 Hz, 1H). ^{13}C NMR (101 MHz, DMSO-d_6) δ 172.90, 138.16, 137.27, 123.27, 123.00, 119.9 (q, J = 323 Hz), 69.97, 62.69, 58.49, 49.21, 48.41, 46.93, 45.53, 45.16. (14 signals expected and 14 signals found). HR MS: calc. for $C_{27}H_{36}O_{10}N_5S_2F_6$ [M – TFSI]$^{+}$: m/z 768.1808; found: m/z 768.1792 (error –2.1 ppm); calc. for $C_{25}H_{36}O_6N_4$ [M – 2TFSI]$^{+2}$: m/z 244.1312; found: m/z 244.1288 (error –9.8 ppm). T_g (DSC) = –39 °C. Conductivity at 25 °C = 2.42 X 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OEIm^{+}EO$_2$Me]$_2$ (TFSI^{-})$_2$ (8c):** General procedure 6 was used to produce an oil (4.94 g, 52%) by using: **4** (3.30 g, 8.34 mmol), **6c** (5.00 g, 29.37 mmol), and LiTFSI (6.00 g, 20.9 mmol). ^{1}H NMR (500 MHz, CD_2Cl_2) δ: 8.82 (s, 2H), 7.54 (s, 2H), 7.50 (s, 2H), 6.25 (s, 2H), 4.46 (m, 8H), 4.41–4.36 (m, 4H), 3.90–3.83 (m, 4H), 3.65 (s, 4H), 3.55 (s, 4H), 3.36 (s, 6H), 3.08 (s, 2H), 2.72 (s, 2H), 1.82 (m, 1H), 1.49 (m, 1H). ^{13}C NMR (126 MHz, CD_2Cl_2) δ: 173.84, 138.21, 136.74, 123.91, 122.78, 120.22 (q, J = 323 Hz), 71.92, 70.57, 68.68, 62.80, 58.89, 50.40, 49.23, 47.80, 45.92, 45.49 (16 signals expected and 16 major signals found; additionally, minor signals were observed for most carbon signals, this is due to an equilibrium between hydrogen bonded and non-hydrogen bonded ethyleneoxy-imidazolium moieties in CD_2Cl_2; see text for explanation). ^{13}C NMR (126 MHz, DMSO-d_6) δ 172.95, 138.17, 137.27, 123.31, 122.98, 119.91 (q, J = 323 Hz), 71.49, 69.77, 68.55, 62.78, 58.49, 49.34, 48.44, 46.94, 45.56, 45.17 (16 signals expected and 16 signals found). HR MS: calc. for $C_{31}H_{44}O_{12}N_5S_2F_6$

[M - TFSI]$^{+}$: m/z 856.2327; found: m/z 856.2312 (error –1.8 ppm); calc. for $C_{29}H_{44}O_8N_4$ (M – 2 TFSI)$^{+2}$: m/z 288.1580; found: m/z 288.1576 (error –1.4 ppm). T_g (DSC) = –45 °C. Conductivity at 25 °C = 2.95 X 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OEIm^{+}EO$_3$Me]$_2$ (TFSI^{-})$_2$ (8d):** General procedure 6 was used to produce an oil (7.57 g, 59%) by using: **4** (4.15 g, 10.5 mmol), **6d** (4.97 g, 23.12 mmol), and LiTFSI (6.50 g, 22.6 mmol). ^{1}H NMR (500 MHz, DMSO-*d$_6$*) δ: 9.16 (s, 2H), 7.79 (m, 4H), 6.29–6.19 (m, 2H), 4.54–4.41 (m, 6H), 4.41–4.33 (m, 4H), 4.22 (m, 2H), 3.81–3.75 (m, 4H), 3.59–3.53 (m, 4H), 3.53–3.46 (m, 8H), 3.43 (m, 4H), 3.24 (s, 6H), 2.98–2.92 (m, 2H), 2.63 (d, 2H), 1.72 (d, *J* = 9 Hz, 1H), 1.32 (d, *J* = 9 Hz, 1H). ^{13}C NMR (126 MHz, DMSO-*d$_6$*) δ: 172.99, 138.21, 137.28, 123.41, 122.96, 119.94 (J = 323 Hz), 71.71, 70.01, 69.98, 69.93, 68.59, 62.80, 58.51, 49.31, 48.43, 46.97, 45.58, 45.20 (17 signals expected and 17 signals found). HR MS: calc. for $C_{35}H_{52}O_{14}N_5S_2F_6$ [M – TFSI]$^{+}$: m/z 944.2851; found: m/z 944.2840 (error –1.1 ppm); calc. for $C_{33}H_{52}O_{10}N_4$ [M – 2TFSI]$^{+2}$: m/z 332.1836; found: m/z 332.1840 (error 1 ppm). T_g (DSC) = –50 °C. Conductivity at 25 °C = 7.10 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OEIm^{+}EO$_4$Me]$_2$ (TFSI^{-})$_2$ (8e):** General procedure 6 was used to produce an oil (2.38 g, 70%) by using: **4** (1.03 g, 2.60 mmol), **6e** (1.90 g, 7.37 mmol) and LiTFSI (1.86 g, 6.48 mmol). ^{1}H NMR (500 MHz, DMSO-*d$_6$*) δ 9.14 (s, 2H), 7.78 (m, 4H), 6.23 (m, 2H), 4.46 (m, 6H), 4.41–4.35 (m, 4H), 4.22 (m, 2H), 3.79 (t, *J* = 4 Hz, 4H), 3.60–3.53 (m, 4H), 3.53–3.47 (m, 16H), 3.43 (t, *J* = 4 Hz, 4H), 3.24 (s, 3H), 3.23 (s, 3H), 2.95 (m, 2H), 2.63 (d, 2H), 1.72 (d, *J* = 9 Hz, 1H), 1.32 (d, *J* = 9 Hz, 1H). ^{13}C NMR (126 MHz, DMSO-*d$_6$*) δ 172.98, 138.22, 137.30, 123.41, 122.97, 119.95 (q, J = 323 Hz),

71.72, 70.19, 70.17, 70.03, 70.00, 69.98, 69.97, 68.60, 62.81, 58.49, 49.35, 48.44, 46.98, 45.59, 45.21 (20 signals expected and 20 signals found). HR MS: calc. for $C_{41}H_{60}O_{20}N_6S_4F_{12}Na$ $[M + Na]^+$: m/z 1335.2446; found: m/z 1335.2462 (error 1.2 ppm); calc. for $C_{39}H_{60}O_{16}N_5S_2F_6$ $[M – TFSI]^+$: m/z 1032.3375; found: m/z 1032.3392 (error 1.1 ppm); calc. for $C_{37}H_{60}O_{12}N_4$ $[M – 2TFSI]^{+2}$: m/z 376.2098; found: m/z 376.2111 (error 3.3 ppm). T_g (DSC) = –42 °C. Conductivity at 25°C = 3.88 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_2$Im$^+$Bu]$_2$ (TFSI$^-$)$_2$ (8f):** General procedure 6 was used to produce an oil (1.28 g, 52%) by using **3a** (1.45 g, 2.18 mmol), **6a** (1.55 g, 12.5 mmol) and LiTFSI (2.36 g, 8.22 mmol). ^{1}H NMR (400 MHz, DMSO-d_6) δ 9.10 (s, 2H), 7.78 (t, J = 2 Hz, 2H), 7.71 (t, J = 2 Hz, 2H), 6.23 (t, J = 2 Hz, 1H), 4.36–4.29 (m, 4H), 4.20–4.07 (m, 6H), 3.95–3.90 (m, 2H), 3.78–3.71 (m, 4H), 3.57 (t, J = 5 Hz, 4H), 2.96–2.91 (m, 2H), 2.54 (d, J = 2 Hz, 2H), 1.89 (d, J = 9 Hz, 1H), 1.75 (p, J = 8 Hz, 4H), 1.32 (d, J = 9 Hz, 1H), 1.28–1.18 (m, 4H), 0.88 (t, J = 8 Hz, 6H). ^{13}C NMR (101 MHz, DMSO-d_6) δ 173.21, 138.22, 136.74, 123.23, 122.66, 119.91 (q, J = 323 Hz), 68.45, 63.69, 49.20, 49.02, 46.99, 45.55, 45.22, 31.80, 19.20, 13.68 (16 signals expected and 16 signals found). HR MS: calc. for $C_{41}H_{60}O_{20}N_6S_4F_{12}Na$ $[M + Na]^+$: m/z 1335.2446; found: m/z 1335.2462 (error 1.2 ppm); calc. for $C_{33}H_{48}O_{10}N_5S_2F_6$ $[M – TFSI]^+$: m/z 852.2741; found: m/z 852.2743 (error 0.2 ppm); calc. for $C_{31}H_{48}O_6N_4$ $[M – 2TFSI]^{+2}$: m/z 286.1781; found: m/z 286.1791 (error 3.3 ppm). T_g (DSC) = -47 °C. Conductivity at 25 °C = 7.75 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_2$Im$^+$EOMe]$_2$ (TFSI$^-$)$_2$ (8g)**: General procedure 6 was used to produce an oil (2.54 g, 73%) by using **3a** (2.03 g, 3.05 mmol), **6b** (1.53 g, 12.2 mmol) and LiTFSI (2.28 g, 7.94 mmol). ^{1}H NMR (500 MHz, acetone-d_6) δ 9.04 (s, 2H), 7.78 (s,

4H), 6.27 (s, 2H), 4.62–4.54 (m, 8H), 4.27 (m, 2H), 4.12 (m, 2H), 3.97 (t, *J* = 5 Hz, 4H), 3.83 (t, J = 5 Hz, 4H), 3.74 (t, *J* = 5 Hz, 4H), 3.36 (s, 6H), 3.06 (s, 2H), 2.66 (d, *J* = 2 Hz, 2H), 2.08 (d, *J* = 8 Hz, 1H), 1.41 (d, *J* = 8.5 Hz, 1H). ^{13}C NMR (126 MHz, acetone-d_6) δ 174.01, 138.80, 137.70, 123.95, 123.77, 121.07 (q, *J* = 320 Hz), 70.81, 69.68, 69.44, 64.38, 59.00, 50.64, 50.60, 47.99, 46.46, 45.94 (16 peaks expected and 16 peaks found). HR MS: calc. for $C_{29}H_{44}O_8N_4$ [M – 2TFSI]$^{+2}$: m/z 288.1574; found: m/z 288.1596 (error 7.5 ppm); calc. for $C_{31}H_{44}O_{12}N_5S_2F_6$ [M – TFSI]$^+$: m/z 856.2327; found: m/z 856.2356 (error 3.4 ppm); . T_g (DSC) = –39 °C. Conductivity at 25 °C = 4.80 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_2$Im$^+$EO$_2$Me]$_2$ (TFSI$^-$)$_2$ (8h):** General procedure 6 was used to produce an oil (1.54 g, 58%) by using **3a** (1.43 g, 2.15 mmol), **6c** (1.54 g, 12.2 mmol) and LiTFSI (1.75 g, 6.10 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.08 (s, 2H), 7.76 (t, *J* = 2 Hz, 2H), 7.73 (t, *J* = 2 Hz, 2H), 6.26 (t, *J* = 2 Hz, 2H), 4.37 (m, 8H), 4.16 (m, 2H), 3.96 (m, 2H), 3.78 (t, *J* = 4 Hz, 8H), 3.59 (t, *J* = 4 Hz, 4H), 3.57–3.52 (m, 4H), 3.44–3.39 (m, 4H), 3.22 (s, 6H), 2.99–2.94 (m, 2H), 2.58 (d, *J* = 2 Hz, 2H), 1.91 (d, *J* = 9 Hz, 1H), 1.35 (d, *J* = 9 Hz, 1H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 173.26, 138.24, 137.09, 123.02, 123.00, 119.93 (q, *J* = 323 Hz), 71.52, 69.82, 68.56, 68.53, 68.47, 63.70, 58.52, 49.30, 49.21, 47.01, 45.57, 45.24 (18 signals expected and 18 signals found). HR MS: calc. for $C_{35}H_{52}O_{14}N_5S_2F_6$ [M – TFSI]$^+$: m/z 944.2851; found: m/z 944.2863 (error 1.3 ppm); calc. for $C_{33}H_{52}O_{10}N_4$ [M – 2TFSI]$^{+2}$: m/z 332.1836; found: m/z 332.1838 (error 0.6 ppm). T_g (DSC) = –49 °C. Conductivity at 25 °C = 7.72 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_2$Im$^+$EO$_3$Me]$_2$ (TFSI$^-$)$_2$ (8i):** General procedure 6 was used to produce an oil (2.45 g, 75%) by using **3a** (1.67 g, 2.50 mmol), **6d** (1.85 g, 9.10 mmol) and LiTFSI (1.85 g, 6.46 mmol). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.81 (s, 2H), 7.52 (s, 2H), 7.42 (s, 2H), 6.29–6.16 (m, 2H), 4.37 (m, 8H), 4.20–4.15 (m, 3H), 3.84 (m, 8H), 3.67 (m, 8H), 3.64–3.60 (m, 8H), 3.55 (m, 4H), 3.36 (s, 6H), 3.08 (s, 2H), 2.65 (s, 2H), 2.03 (d, *J* = 9 Hz, 1H), 1.49 (d, *J* = 9 Hz, 1H). ^{13}C NMR (126 MHz, $CDCl_3$) δ 173.55, 137.95, 136.33, 123.18, 122.76, 119.80 (q, J = 321 Hz), 77.23, 71.80, 70.29, 70.21, 69.04, 68.55, 68.52, 63.55, 58.87, 49.79, 47.37, 45.67, 45.34 (20 signals expected and 19 signals found; peak @ 70.21 is considered to be 2 overlapping peaks). HR MS: calc. for $C_{37}H_{60}O_{12}$ [M – 2TFSI]$^{+2}$: m/z 376.2098 second isotope peak; found: m/z 376.2082 (error –4.4 ppm). T_g (DSC) = –54 °C. Conductivity at 25 °C = 5.39 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_2$Im$^+$EO$_4$Me]$_2$ (TFSI$^-$)$_2$ (8j):** General procedure 6 was used to produce an oil (3.43 g, 50%) by using **3a** (3.28 g, 4.92 mmol), **6e** (3.17 g, 12.3 mmol) and LiTFSI (4.70 g, 16.4 mmol). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.84 (s, 2H), 7.53 (s, 2H), 7.45 (s, 2H), 6.23 (s, 2H), 4.38 (s, 8H), 4.18 (s, 4H), 3.91–3.81 (m, 8H), 3.74–3.58 (m, 24H), 3.56–3.50 (m, 4H), 3.34 (s, 6H), 3.08 (s, 2H), 2.65 (s, 2H), 2.03 (d, *J* = 9 Hz, 1H), 1.49 (d, *J* = 9 Hz, 1H). ^{13}C NMR (126 MHz, $CDCl_3$) δ 173.55, 137.96, 136.47, 123.18, 122.81, 119.83 (q, J = 319 Hz), 71.85, 70.43, 70.36, 70.32, 70.27, 70.23, 69.04, 68.58, 68.55, 63.56, 58.86, 49.84, 49.81, 47.38, 45.67, 45.35 (22 signals expected and 22 signals found). HR MS: calc. for $C_{43}H_{68}O_{18}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1120.3899; found: m/z 1120.3860 (error –3.5 ppm); calc. for $C_{41}H_{68}O_{14}N_4$ [M – 2TFSI]$^{+2}$: m/z 420.2361;

found: m/z 420.2351 (error –2.4 ppm). T_g (DSC) = –57 °C. Conductivity at 25 °C = 6.26 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_3$Im$^+$Bu]$_2$ (TFSI$^-$)$_2$ (8k):** General procedure 6 was used to produce an oil (1.99 g, 61 %) by using **3b** (2.01 g, 2.66 mmol), **6a** (0.800 g, 6.44 mmol) and LiTFSI (1.91 g, 6.65 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.13 (s, 2H), 7.80 (t, J = 2 Hz, 2H), 7.75 (t, J = 2 Hz, 2H), 6.24 (t, J = 2 Hz, 2H), 4.38–4.31 (m, 4H), 4.22–4.12 (m, 6H), 3.99–3.94 (m, 2H), 3.81–3.74 (m, 4H), 3.55–3.50 (m, 12H), 2.99 (s, 2H), 2.58 (d, J = 2 Hz, 2H), 1.96–1.94 (m, 1H), 1.77 (quin, J = 8 Hz, 4H), 1.35–1.33 (m, 1H), 1.25 (h, J = 8 Hz, 4H), 0.91 (t, J = 8 Hz, 6H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 173.30, 138.22, 136.75, 123.25, 122.67, 119.93 (q, J = 323 Hz), 69.97, 69.92, 68.61, 68.56, 63.90, 49.27, 49.02, 46.96, 45.60, 45.18, 31.81, 19.21, 13.70 (19 signals expected and 19 found). HR MS: calc. for $C_{37}H_{56}O_{12}N_5S_2F_6$ [M – TFSI]$^+$: m/z 940.3266; found: m/z 940.3186 (error –8.5 ppm). T_g (DSC) = –47 °C. Conductivity at 25 °C = 7.66 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_3$Im$^+$EOMe]$_2$ (TFSI$^-$)$_2$ (8l)**: General procedure 6 was used to produce an oil (0.86 g, 50 %) by using **3b** (1.06 g, 1.41 mmol), **6b** (0.712 g, 5.65 mmol) and LiTFSI (1.05 g, 3.66 mmol). ^{1}H NMR (500 MHz, acetone-d_6) δ 9.04 (s, 2H), 7.80 (s, 2H), 7.76 (s, 2H), 6.25 (s, 2H), 4.57 (s, 8H), 4.27 (m, 2H), 4.11 (m, 2H), 3.96 (m, 4H), 3.84 (m, 4H), 3.73–3.60 (m, 12H), 3.37 (s, 6H), 3.06 (s, 2H), 2.63 (s, 2H), 2.10 (m, 1H), 1.40 (m, 1H). ^{13}C NMR (126 MHz, acetone-d_6) δ 173.07, 137.84, 136.73, 123.04, 122.81, 120.13 (q, J = 323 Hz), 70.10, 69.89, 68.71, 68.55, 63.64, 58.07, 49.71, 49.65, 46.93, 45.57, 44.89 (18 signals expected and 17 signals found; peak @ 70.10 ppm is considered to be two peaks overlapping). HR MS: calc. for $C_{35}H_{52}O_{14}N_5S_2F_6$ [M –

TFSI]$^+$: m/z 944.2851; found: m/z 944.2853 (error 0.3 ppm); calc. for $C_{33}H_{52}O_{10}N_4$ [M – 2 TFSI]$^{+2}$: m/z 332.1836; found: m/z 332.1849 (error 3.7 ppm). T_g (DSC) = -43 °C. Conductivity at 25 °C = 6.54 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_3$Im$^+$EO$_2$Me]$_2$ (TFSI$^-$)$_2$ (8m):** General procedure 6 was used to produce an oil (0.93 g, 61%) by using **3b** (0.884 g, 1.17 mmol), **6c** (0.898 g, 5.27 mmol) and LiTFSI (0.90 g, 3.1 mmol). ^{1}H NMR (500 MHz, acetone-d_6) δ 9.06 (s, 2H), 7.79 (s, 4H), 6.25 (s, 2H), 4.56 (s, 8H), 4.31–4.24 (m, 2H), 4.15–4.07 (m, 2H), 3.96 (m, 8H), 3.73–3.60 (m, 16H), 3.53–3.48 (m, 4H), 3.31 (s, 6H), 3.05 (s, 2H), 2.63 (s, 2H), 2.10 (d, J = 9 Hz, 1H), 1.40 (d, J = 9 Hz, 1H). ^{13}C NMR (126 MHz, acetone-d_6) δ 173.06, 137.84, 136.82, 122.92, 122.88, 120.12 (q, J = 323 Hz), 71.54, 70.11, 70.09, 69.94, 68.71, 68.57, 68.46, 63.64, 57.93, 49.73, 49.70, 46.93, 45.57, 44.88 (20 peaks expected and 20 peaks found). HR MS: calc. for $C_{39}H_{60}O_{16}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1032.3375; found: m/z 1032.3372 (error –0.3 ppm); calc. for $C_{37}H_{60}O_{12}N_4$ [M – 2TFSI]$^+$: m/z 376.2098; found: m/z 376.2113 (error 3.9 ppm). T_g (DSC) = –47 °C. Conductivity at 25 °C = 8.95 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_3$Im$^+$EO$_3$Me]$_2$ (TFSI$^-$)$_2$ (8n):** General procedure 6 was used to produce an oil (1.27 g, 48%) by using **3b** (1.42 g, 1.88 mmol), **6d** (1.01 g, 4.70 mmol) and LiTFSI (1.35 g, 4.70 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.08 (s, 2H), 7.75 (dt, J = 9, 2 Hz, 4H), 6.24 (t, J = 2 Hz, 2H), 4.37 (t, J = 4 Hz, 8H), 4.16 (m, 2H), 3.97 (m, 2H), 3.81–3.75 (m, 8H), 3.55 (m, 12H), 3.53–3.48 (m, 12H), 3.43 (m, 4H), 3.24 (s, 6H), 3.02–2.96 (m, 2H), 2.59 (d, J = 2 Hz, 2H), 1.95 (d, J = 9 Hz, 1H), 1.35 (d, J = 9 Hz, 1H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 173.34, 138.23, 137.05, 123.08, 122.99, 119.95 (q, J =

323 Hz), 71.71, 70.03, 69.99, 69.97, 69.94, 68.64, 68.62, 68.58, 63.92, 58.50, 49.26, 46.97, 45.60, 45.18 (22 signals expected and 20 found). HR MS: calc. for $C_{43}H_{68}O_{18}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1120.3899; found: m/z 1120.3946 (error 4.1 ppm); calc. for $C_{41}H_{68}O_{14}N_4$ [M – 2TFSI]$^{+2}$: m/z 420.2361; found: m/z 420.2381 (error 4.8 ppm). T_g (DSC) = –46 °C. Conductivity at 25 °C = 8.93 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_3$Im$^+$EO$_4$Me]$_2$ (TFSI$^-$)$_2$ (8o):** General procedure 6 was used to produce an oil (0.60 g, 61%) by using **3b** (0.503 g, 0.667 mmol), **6e** (0.430 g, 1.66 mmol) and LiTFSI (0.479 g, 1.67 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.08 (s, 2H), 7.75 (m, 4H), 6.24 (t, J = 2 Hz, 2H), 4.37 (t, J = 5 Hz, 8H), 4.16 (m, 2H), 3.97 (m, 2H), 3.78 (m, 8H), 3.60–3.46 (m, 32H), 3.43 (m, 4H), 3.24 (s, 3H), 3.23 (s, 3H) 3.02–2.97 (m, 2H), 2.59 (d, J = 2 Hz, 2H), 1.95 (d, J = 9 Hz, 1H), 1.35 (d, J = 9 Hz, 1H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 173.33, 138.24, 137.08, 123.08, 123.00, 119.95 (q, J = 323 Hz), 71.72, 70.21, 70.18, 70.06, 70.04, 70.01, 69.99, 69.94, 68.65, 68.62, 68.59, 63.92, 58.51, 58.49, 49.30, 49.26, 46.97, 45.61, 45.19 (24 signals expected and 25 signals found). HR MS: calc. for $C_{47}H_{76}O_{20}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1208.4424; found: m/z 1208.4537 (error 9.4 ppm); calc. for $C_{45}H_{76}O_{16}N_4$ [M – 2TFSI]$^{+2}$: m/z 464.2623; found: m/z 464.2667 (error 9.6 ppm). T_g (DSC) = –45 °C. Conductivity at 25 °C = 7.94 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_4$Im$^+$Bu]$_2$ (TFSI$^-$)$_2$ (8p):** General procedure 6 was used to produce an oil (1.72 g, 54%) by using **3c** (2.04 g, 2.42 mmol), **6a** (0.751 g, 6.05 mmol) and LiTFSI (1.74 g, 6.05 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.13 (s, 2H), 7.79 (t, J = 2 Hz, 2H), 7.76 (t, J = 2 Hz, 2H), 6.23 (t, J = 2 Hz, 2H), 4.38–4.32 (m, 4H), 4.22–4.13 (m,

6H), 3.98 (m, 2H), 3.80–3.74 (m, 4H), 3.61–3.53 (m, 8H), 3.50 (m, 12H), 3.00–2.97 (m, 2H), 2.58 (d, *J* = 2 Hz, 2H), 1.95 (m, 1H), 1.78 (quin, *J* = 7 Hz, 4H), 1.34 (m, 1H), 1.26 (sex, *J* = 7 Hz, 4H), 0.91 (t, *J* = 7 Hz, 6H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 173.33, 138.24, 136.76, 123.29, 122.67, 119.95 (q, *J* = 323 Hz), 70.17, 70.12, 70.04, 69.97, 68.63, 68.54, 63.94, 49.27, 49.03, 46.96, 45.59, 45.17, 31.81, 19.21, 13.70 (21 signals expected and 21 signals found). HR MS: calc. for $C_{41}H_{64}O_{14}N_5S_2F_6$ [M – TFSI]$^{+1}$: m/z 1028.3790; found: m/z 1028.3810 (error 1.9 ppm); calc. for $C_{39}H_{64}O_{10}N_4$ [M – 2 TFSI]]$^{+2}$: m/z 374.2306; found: m/z 374.2315 (error 2 ppm). T_g (DSC) = –45 °C. Conductivity at 25 °C = 6.82 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_4$Im$^+$EOMe]$_2$ (TFSI$^-$)$_2$** (**8q**): General procedure 6 was used to produce an oil (1.25 g, 43%) by using **3c** (1.88 g, 2.23 mmol), **6b** (1.51 g, 12.0 mmol) and LiTFSI (2.09 g, 7.28 mmol). ^{1}H NMR (500 MHz, acetone-d_6) δ 9.02 (s, 2H), 7.77 (s, 2H), 7.72 (s, 2H), 6.24 (t, *J* = 2 Hz, 2H), 4.53 (m, 8H), 4.25 (m, 2H), 4.09 (m, 2H), 3.95–3.91 (m, 4H), 3.84–3.80 (m, 4H), 3.68 (m, 8H), 3.62 (m, 12H), 3.36 (s, 6H), 3.06 – 3.02 (m, 2H), 2.58 (d, *J* = 2 Hz, 2H), 2.08 (d, *J* = 9 Hz, 1H), 1.38 (d, *J* = 9 Hz, 1H). ^{13}C NMR (126 MHz, acetone-d_6) δ 173.13, 137.85, 136.77, 123.03, 122.72, 120.08 (q, J = 323 Hz), 70.25, 70.13, 70.12, 70.09, 69.88, 68.67, 68.46, 63.69, 58.08, 49.66, 49.59, 46.89, 45.53, 44.86 (20 peaks expected and 20 peaks found). HR MS: calc. for $C_{39}H_{60}O_{16}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1032.3375; found: m/z 1032.3376 (error 0.08 ppm); calc. for $C_{37}H_{60}O_{12}N_4$ [M – 2TFSI]$^{+2}$: m/z 376.2098; found: m/z 376.2117 (error 4.7 ppm). T_g (DSC) = –43 °C. Conductivity at 25 °C = 6.51 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_4$Im$^+$EO$_2$Me]$_2$ (TFSI$^-$)$_2$ (8r):** General procedure 6 was used to produce an oil (1.73 g, 45%) by using **3c** (2.29 g, 2.71 mmol), **6c** (0.856 g, 6.79 mmol) and LiTFSI (1.95 g, 6.79 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.08 (s, 2H), 7.75 (m, 4H), 6.24 (t, J = 2 Hz, 2H), 4.37 (t, J = 5 Hz, 8H), 4.17 (m, 2H), 4.03–3.95 (m, 2H), 3.78 (t, J = 5 Hz, 8H), 3.59–3.53 (m, 12H), 3.53–3.47 (m, 12H), 3.44–3.40 (m, 4H), 3.22 (s, 6H), 3.02–2.96 (m, 2H), 2.59 (d, J = 2 Hz, 2H), 1.96 (d, J = 9 Hz, 1H), 1.34 (d, J = 9 Hz, 1H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 173.34, 138.24, 137.09, 123.07, 122.98, 119.95 (q, J = 323 Hz), 71.53, 70.17, 70.11, 70.04, 69.83, 69.83, 68.62, 68.58, 63.95, 58.51, 49.30, 49.28, 46.95, 45.59, 45.17 (22 signals expected and 21 signals found). HR MS: calc. for $C_{43}H_{68}O_{18}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1120.3899; found: m/z 1120.3891 (error –0.8 ppm); calc. for $C_{41}H_{68}O_{14}N_4$ [M – 2TFSI]$^{+2}$: m/z 420.2361; found: m/z 420.2374 (error 3.2 ppm). T_g (DSC) = –46 °C. Conductivity at 25 °C = 9.57 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_4$Im$^+$EO$_3$Me]$_2$ (TFSI$^-$)$_2$ (8s):** General procedure 6 was used to produce an oil (2.07 g, 67%) by using **3c** (1.76 g, 2.09 mmol), **6d** (1.15 g, 5.39 mmol) and LiTFSI (1.58 g, 5.50 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.07 (s, 2H), 7.75 (m, 4H), 6.24 (t, J = 2 Hz, 2H), 4.37 (t, J = 5 Hz, 8H), 4.20–4.13 (m, 2H), 3.98 (m, 2H), 3.82–3.75 (m, 8H), 3.59–3.54 (m, 13H), 3.54–3.47 (m, 21H), 3.43 (m, 4H), 3.24 (s, 6H), 3.01–2.97 (m, 2H), 2.58 (d, J = 2 Hz, 2H), 1.95 (d, J = 9 Hz, 1H), 1.34 (d, J = 9 Hz, 1H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 173.33, 138.24, 137.06, 123.06, 123.03, 119.95 (q, J = 323 Hz), 71.72, 70.17, 70.12, 70.04, 70.00, 69.98, 68.62, 68.59, 63.94, 58.52, 49.26, 46.96, 45.60, 45.18 (24 signals expected and 20 signals found). HR MS: calc. for $C_{47}H_{76}O_{20}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1208.4424; found: m/z 1208.4441 (error 1.4 ppm);

calc. for $C_{45}H_{76}O_{16}N_4$ [M – 2TFSI]$^{+2}$: m/z 464.2623; found: m/z 464.2651 (error 6.0 ppm). T_g (DSC) = –45 °C. Conductivity at 25 °C = 7.90 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_4$Im$^+$EO$_4$Me]$_2$ (TFSI$^-$)$_2$ (8t):** General procedure 6 was used to produce an oil (1.08 g, 27%) by using **3c** (2.11 g, 2.50 mmol), **6e** (2.15 g, 8.31 mmol) and LiTFSI (1.79 g, 6.23 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.09 (s, 2H), 7.78–7.72 (m, 4H), 6.24 (m, 2H), 4.37 (m, 8H), 4.16 (m, 2H), 3.98 (m, 2H), 3.82–3.74 (m, 8H), 3.59–3.53 (m, 12H), 3.50 (m, 28H), 3.43 (m, 4H), 3.24 (s, 6H), 3.01 – 2.96 (m, 2H), 2.58 (m, 2H), 1.95 (d, J = 9 Hz, 1H), 1.34 (d, J = 9 Hz, 1H). ^{13}C NMR (101 MHz, DMSO-d_6) δ 173.36, 138.20, 136.97, 122.99, 122.96, 119.88 (q, J = 323), 71.66, 70.14, 70.12, 70.06, 69.98, 69.97, 69.95, 69.94, 68.57, 68.52, 63.93, 58.47, 58.44, 49.22, 46.93, 45.55, 45.12 (26 signals expected and 23 signals found; peaks in the ethyleneoxy region suspected to be overlapping). HR MS: calc. for $C_{53}H_{84}O_{26}N_6S_4F_{12}Na$ [M + Na]$^+$: m/z 1599.4019; found: m/z 1599.3942 (error –4.8 ppm); calc. for $C_{51}H_{84}O_{22}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1296.4948; found: m/z 1296.4889 (error –4.6 ppm). HR MS: calc. for $C_{49}H_{84}O_{18}N_4$ [M - 2TFSI]$^{+2}$: m/z 508.2885; found: m/z 508.2869 (error –3.2 ppm). T_g (DSC) = –47 °C. Conductivity at 25 °C = 6.99 x 10^{-5} S/cm.

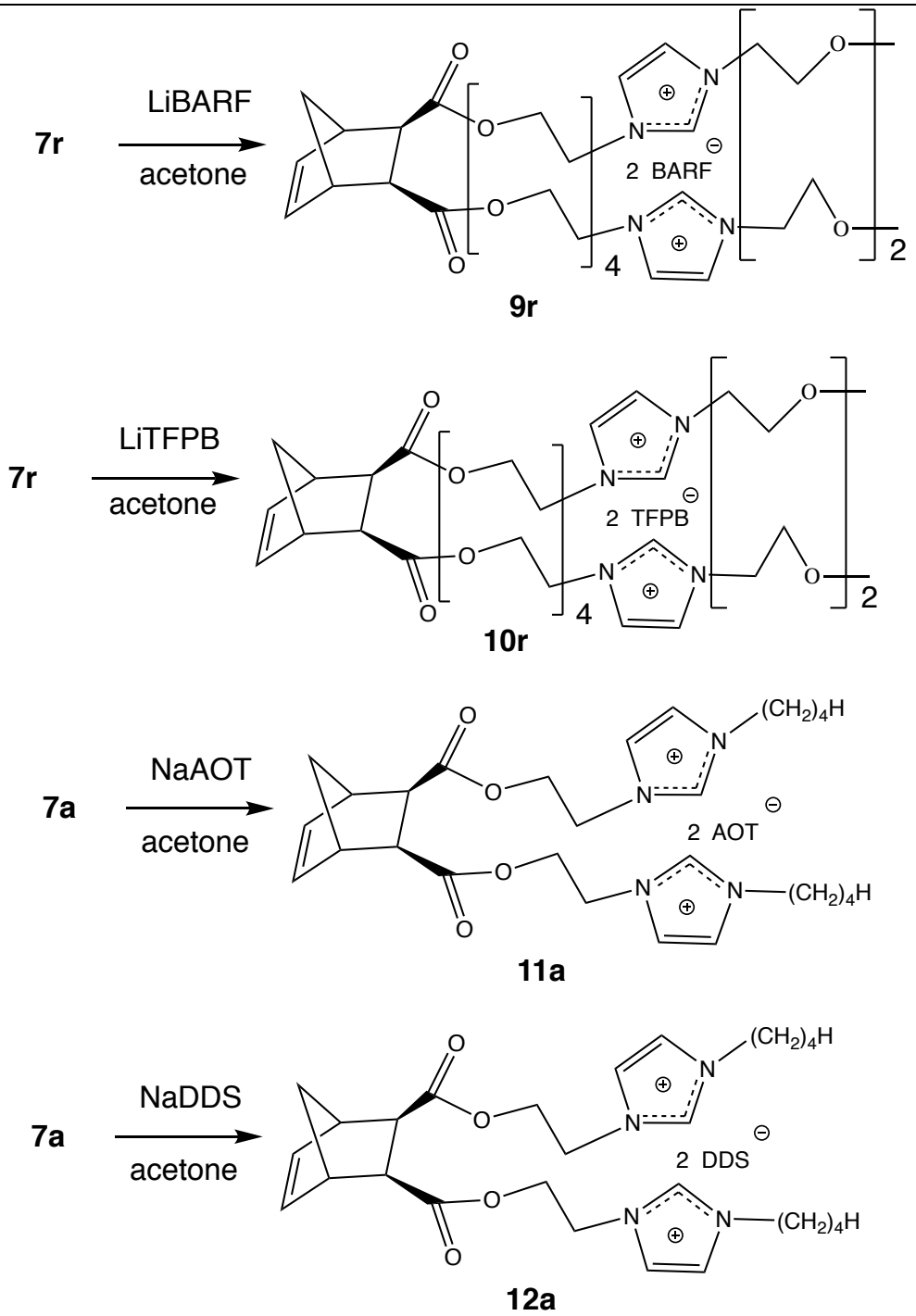
***Exo,Exo*-NB[C(O)OE$_5$Im$^+$EO$_2$Me]$_2$ (TFSI$^-$)$_2$ (8u):** General procedure 6 was used to produce an oil (0.91 g, 35 %) by using **3d** (1.62 g, 1.73 mmol), **6c** (0.65 g, 5.2 mmol) and LiTFSI (1.25 g, 4.35 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.08 (s, 2H), 7.76–7.75 (m, 4H), 6.24 (s, 2H), 4.37 (t, J = 5 Hz, 8H), 4.20–4.12 (m, 2H), 4.00–3.97 (m, 2H), 3.83–3.74 (m, 8H), 3.58–3.49 (m, 32 H), 3.43–3.40 (m, 4H), 3.22 (s, 6H), 3.02–2.94 (m, 2H), 2.60–2.59 (m, 2H), 1.97–1.95 (m, 1H), 1.35–1.33 (m, 1H). ^{13}C NMR (126 MHz,

DMSO-d_6) δ 173.33, 138.23, 137.09, 123.06, 122.97, 119.93 (q, J = 323 Hz), 71.53, 70.22, 70.17, 70.14, 70.04, 69.98, 69.83, 68.61, 68.58, 63.95, 58.52, 49.29, 46.94, 45.59, 45.17 (24 signals expected and 21 signals found, 3 signals expected to be overlapping in ethyleneoxy region). HR MS: calc. for $C_{45}H_{76}O_{16}N_4$ [M - 2TFSI]$^{+2}$: m/z 464.2623; found: m/z 464.2609 (error –3.0 ppm). T_g (DSC) = –46 °C. Conductivity at 25 °C = 7.22 x 10^{-5} S/cm.

***Exo,Exo*-NB[C(O)OE$_6$Im$^+$EO$_2$Me]$_2$ (TFSI$^-$)$_2$ (8v):** General procedure 6 was used to produce an oil (1.03 g, 81 %) by using **3e** (0.813 g, 0.798 mmol), **6c** (0.340 g, 2.00 mmol) and LiTFSI (0.580 g, 2.02 mmol). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.08 (s, 2H), 7.76–7.74 (m, 4H), 6.24 (t, *J* = 2 Hz, 2H), 4.37 (t, *J* = 5 Hz, 8H), 4.18–4.14 (m, 2H), 4.01–3.96 (m, 2H), 3.82–3.73 (m, 8H), 3.58–3.54 (m, 12H), 3.51–3.48 (m, 28H), 3.43–3.41 (m, 4H), 3.22 (s, 6H), 3.02–2.98 (m, 2H), 2.61–2.60 (m, 2H), 1.97–1.95 (m, 1H), 1.35–1.33 (m, 1H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 173.33, 138.23, 137.09, 123.07, 122.97, 119.93 (q, J = 323 Hz), 71.53, 70.24, 70.20, 70.17, 70.14, 70.04, 69.98, 69.83, 68.60, 63.96, 58.53, 49.29, 46.94, 45.58, 45.17 (26 signals expected and 21 signals found, signals expected to be overlapping in ethyleneoxy region). HR MS: calc. for $C_{53}H_{84}O_{26}N_6S_4F_{12}Na$ [M + Na]$^{+1}$: m/z 1599.4024; found: m/z 1599.3987 (error 2.3 ppm); calc. for $C_{53}H_{84}O_{26}N_6S_4F_{12}K$ [M + K]$^{+1}$: m/z 1615.3764; found: m/z 1615.3721 (error 2.7 ppm); calc. for $C_{53}H_{88}O_{26}N_7S_4F_{12}$ [M + NH_4]$^{+1}$: m/z 1594.4470; found: m/z 1594.4405 (error 4.1 ppm). T_g (DSC) = –54 °C. Conductivity at 25 °C = 9.27 x 10^{-5} S/cm.

Effect of other bulky anions on the RT conductivity

BARF and TPFB both take advantage of a negatively charged boron atom that has its charge highly dispersed over four aromatic rings substituted with electron withdrawing substituents. AOT was selected due to its non-symmetrical nature and because it is actually a mixture of eight stereoisomers at three chiral centers and hence was expected to lower T_gs and in turn raise conductivities. DDS was chosen to compare its sulfate moiety to the sulfonate group in AOT. The syntheses were actually anion exchanges, as noted in **Scheme S1**.



Scheme S1. Metathesis reactions to produce norbornene-based imidazolium monomers with various large anions.

General Procedure 7, two-armed norbornene imidazoliums with various anions. ***Exo,Exo*-NB[C(O)OE$_4$Im$^+$EO$_2$Me]$_2$ ($^-$BARF)$_2$ (9r)**: To a flask containing acetone (10 mL) was added **7r** (0.312 g, 0.264 mmol) and NaBARF (0.584 g, 0.649 mmol) with magnetic stirring under nitrogen. The reaction mixture was held at reflux for 20 h, after which solvent was removed by rotary evaporation. The remaining material was taken up in DCM and filtered. The solvent was removed by rotary evaporation and the desired product was collected as a viscous oil (0.676 g, 99%). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.09 (s, 2H), 7.76–7.75 (m, 4H), 7.67 (s, 8H), 7.62 (s, 16H), 6.21 (t, J = 2 Hz, 2H), 4.37 (t, J = 5 Hz, 8H), 4.20–4.14 (m, 2H), 4.00–3.96 (m, 2H), 3.81–3.75 (m, 8H), 3.59–3.46 (m, 24H), 3.42–3.38 (m, 4H), 3.20 (s, 6H), 3.00–2.96 (m, 2H), 2.58 (d, J = 2 Hz, 2H), 1.95 (d, J = 9 Hz, 1H), 1.33 (d, J = 9 Hz, 1H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 173.32, 161.42 (q, J = 50 Hz), 138.19, 137.10, 134.50, 128.96 (qq, J = 32, 3 Hz), 127.69, 124.45 (d, J = 273 Hz), 123.03 (d, J = 10 Hz), 121.19, 118.05, 71.53, 70.17, 70.11, 70.05, 69.97, 69.82, 68.63, 68.59, 63.93, 58.46, 55.34, 49.30, 46.95, 45.58, 45.15, 31.08 (27 signals expected and 27 signals found). HR MS: calc. for $C_{73}H_{80}BN_4O_{14}F_{24}$ [M - BARF]$^+$: m/z 1703.5381; found: m/z 1703.5376 (error –0.3 ppm). T_g (DSC) = –26, -6 °C. Conductivity at 25 °C = 3.19 x 10^{-8} S/cm.

***Exo,Exo*-NB[C(O)OE$_4$Im$^+$EO$_2$Me]$_2$ (TPFB$^-$)$_2$ (10r):** By General Procedure 7 **7r** (0.129 g, 0.109 mmol) and lithium tetrakis(pentafluorophenyl)boron (0.584 g, 0.670 mmol) led to an oil (0.225 g, 95%). ^{1}H NMR (500 MHz, acetone-d_6) δ 9.14 (s, 2H), 7.83–7.81 (m, 4H), 6.21 (s, 2H), 4.59 (s, 8H), 4.33–4.22 (m, 2H), 4.12–4.10 (m, 2H), 3.96 (s, 8H), 3.74–3.57 (m, 28H), 3.29 (s, 6H), 3.04 (s, 2H), 2.60 (s, 2H), 1.38 (s, 1H), 1.23 (s, 1H). ^{13}C

NMR (126 MHz, acetone-d_6) δ 173.08, 148.17 (d, J = 238 Hz), 137.75, 137.18 (tt, J = 247, 14 Hz), 136.98, 124.16, 122.95, 122.80, 71.55, 70.26, 70.16, 70.13, 70.10, 69.95, 68.69, 68.52, 68.50, 63.62, 57.83, 49.74, 49.72, 46.91, 45.54, 44.84 (25 signals expected and 24 signals found, two aromatic signals overlapping due to splitting of aryl C-F signals). HR MS: calc. for $C_{65}H_{68}BF_{20}N_4O_{14}$ [M - TPFB]$^+$: m/z 1519.4506; found: m/z 1519.4415 (error 6.0 ppm); calc. for $C_{89}H_{68}B_2F_{40}N_4O_{14}Na$ [M + Na]$^+$: m/z 2221.4177; found: m/z 2221.4037 (error 6.3 ppm). T_g (DSC) = –27 °C. Conductivity at 25 °C not measured.

***Exo,Exo*-NB[C(O)OEIm$^+$Bu]$_2$ (AOT$^-$)$_2$ (11a):** By General Procedure 7 **7a** (A = Br) (1.21 g, 1.88 mmol) and dioctyl sulfosuccinate sodium salt (AOT, 2.10 g, 4.72 mmol) yielded an oil (1.36 g, 55%). ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.24–9.17 (m, 2H), 7.87–7.74 (m, 4H), 6.22 (m, 2H), 4.48–4.42 (m, 8H), 4.23–4.19 (m, 8H), 3.95–3.83 (m, 20H), 3.65 (dd, J = 12, 4 Hz, 4H), 2.96–2.91 (m, 6H), 2.89 (s, 2H), 2.82 (d, J = 4 Hz, 3H), 2.79 (d, J = 4 Hz, 2H), 2.62 (d, J = 2 Hz, 2H), 1.77 (p, J = 8 Hz, 6H), 1.70 (d, J = 9 Hz, 2H), 1.50 (bs, 10H), 1.41–1.13 (m, 30H), 0.94–0.79 (m, 22H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 172.92, 171.48, 168.83, 138.18, 137.05, 136.78, 123.23, 122.99, 122.63, 66.65, 66.58, 66.55, 66.51, 62.78, 61.89, 59.74, 52.12, 49.08, 48.94, 48.46, 46.94, 45.56, 45.20, 38.64, 38.59, 38.56, 34.55, 31.86, 30.20, 30.08, 30.02, 28.80, 23.65, 23.62, 23.47, 23.44, 22.88, 22.85, 19.25, 19.19, 14.37, 14.35, 13.74, 11.27, 11.24, 11.20 (34 signals expected considering a single isomer of AOT, but AOT contains eight stereoisomers at three chiral centers, 46 signals found with many appearing to overlap). HR MS: calc. for $C_{67}H_{114}N_4O_{18}S_2Na$ [M + Na]$^+$: m/z 1349.7467; found: m/z 1349.7467 (error 0 ppm); calc.

for $C_{47}H_{77}N_4O_{11}S$ [M - AOT]$^+$: m/z 905.5310; found: m/z 905.5312 (error 0.2 ppm). T_g (DSC) = –25 °C. Conductivity at 25 °C = 2.57 x 10^{-9} S/cm.

***Exo,Exo*-NB[C(O)OEIm$^+$Bu]$_2$ (DDS$^-$)$_2$ (12a):** By General Procedure 7 **7a** (A = Br) (0.78 g, 1.2 mmol) and dodecyl sodium sulfate (DDS) (0.88 g, 3.1 mmol) afforded a viscous oil (0.96 g, 83%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 9.28 (t, *J* = 2 Hz, 2H), 7.85–7.81 (m, 4H), 6.20 (t, *J* = 2 Hz, 2H), 4.42–4.40 (m, 4H), 4.21–4.17 (m, 8H), 3.65 (t, *J* = 7 Hz, 2H), 2.92–2.91 (m, 2H), 2.60 (d, *J* = 1.8 Hz, 2H), 1.82–1.64 (m, 8H), 1.50–1.39 (m, 4H), 1.22 (s, 30H), 0.93–0.80 (m, 24H). ^{13}C NMR (101 MHz, DMSO-d_6) δ 172.92, 138.16, 137.03, 123.21, 122.96, 65.95, 62.77, 59.70, 49.06, 48.45, 46.92, 45.54, 31.81, 31.74, 29.52, 29.51, 29.47, 29.23, 29.16, 25.97, 22.54, 19.16, 14.40, 13.74 (24 peaks expected and 24 peaks found). HR MS: calc. for $C_{27}H_{40}N_4O_4$ [M – 2 DDS]$^{+2}$: m/z 242.1519; found: m/z 242.1534 (error –6.2 ppm). T_g (DSC) = 5 °C. Conductivity at 25 °C = 1.24 x 10^{-10} S/cm.

***Exo*-NBC(O)OE$_4$Im$^+$EOMe TFSI$^-$ (15b): 15b** (2.96g, 84%) was synthesized via General Procedure 8 using 1-(2'-methoxyethyl)imidazole (**6b**) in the final quaternization. ^{1}H NMR (400 MHz, CD_3CN) δ 8.58 (s, 1H), 7.46 (t, *J* = 6, 1H), 7.40 (t, *J* = 6, 1H), 6.14 (m, 2H), 4.30 (m, 5H), 4.19 (m, 2H), 3.60 (t, *J* = 4, 2H), 3.70 (t, *J* = 6, 2H), 3.64 (t, *J* = 6, 2H), 3.52-3.65 (m, 10H), 3.00 (bs, 1H), 2.91 (bs, 1H), 2.29 (m, obscured by H_2O), 1.87 (m, 1H), 1.49 (d, *J* = 8, 1H), 1.33 (m, 2H). ^{1}H NMR (400 MHz, DMSO-d_6) δ 9.09 (s, 1H), 7.74 (bs, 2H), 6.15 (m, 2H), 4.37 (t, *J* = 4, 4H), 4.15 (m, 2H), 3.78 (t, *J* = 4, 2H), 3.68 (t, *J* = 6, 2H), 3.61 (t, *J* = 6, 2H), 3.45-3.67 (m, 8H), 3.27 (s, 3H), 2.97 (bs, 1H), 2.89 (bs, 1H), 2.17 (m, 1H), 1.81 (m, 1H) 1.40 (d, *J* = 8, 1H), 1.28 (m, 2H). ^{13}C NMR (101 MHz, DMSO-d_6) δ 175.25, 137.92, 136.82, 135.63, 123.38, 122.72, 119.52 (q, *J* = 322), 69.75,

69.74, 69.71, 69.60, 69.56, 68.37, 68.17, 63.25, 48.79, 46.10, 45.91, 42.48, 41.09, 35.75, 30.68, 29.93 (23 signals expected and 23 signals found). HR MS: calcd. for $C_{22}H_{35}N_2O_6$ (M – TFSI)$^+$ m/z 432.2490, found m/z 423.2493, (error 0.7 ppm). DSC (5.0 ^{o}C/min): T_g -65 ^{o}C. Conductivity at 25 °C = 2.07 x 10^{-4} S/cm.

***Exo*-NBC(O)OE$_4$Im$^+$EO$_2$Me TFSI$^-$ (15c): 15c** (2.92g, 79%) was synthesized via General Procedure 8 using **6c** in the final quaternization. ^{1}H NMR (500 MHz, CD_3CN) δ 8.65 (s, 1H), 7.45 (m, 2H), 6.14 (m, 2H), 4.29 (t, *J* = 5, 4H), 4.18 (q, *J* = 5, 2H), 3.79 (t, *J* = 5, 4H), 3.7 – 3.45 (m, 14H), 3.28 (s, 3H), 2.99 (s, 1H), 2.90 (s, 1H), 2.19 (m, obscured by water peak), 1.86 (m, 1H), 1.46 (d, *J* = 10, 1H), 1.33 (m, 2H). ^{13}C NMR (101 MHz, DMSO-d_6) δ 175.62, 138.29, 137.05, 136.00, 123.05, 122.90, 119.90 (q, *J* = 322), 72.73, 70.10, 70.02, 69.98, 69.95, 68.75, 68.52, 63.62, 60.62, 58.46, 55.27, 49.23, 49.14, 46.48, 46.28, 42.85, 41.47, 30.30 (25 signals expected and 25 signals found). HR MS: calcd. for $C_{24}H_{39}N_2O_7$ (M - TFSI)$^+$ m/z 467.2757, found m/z 467.2752 (error 1 ppm). DSC (5.0 ^{o}C/min): T_g -69 ^{o}C. Conductivity at 25 °C = 4.39 x 10^{-4} S/cm.

***Exo*-NBC(O)OE$_4$Im$^+$EO$_3$Me TFSI$^-$ (15d): 15d** (2.81g, 71%) was synthesized via General Procedure 8 using 1-(2'-(2"-(2"'-methoxyethoxy)ethoxy)ethyl)imidazole (**6d**) in the final quaternization. ^{1}H NMR (400 MHz, DMSO-d_6) δ 9.09 (s, 1H), 7.74 (bs, 2H), 6.15 (m, 2H), 4.36 (t, *J* = 4, 4H), 4.15 (m, 2H), 3.78 (t, *J* = 6, 2H), 3.60 (t, *J* = 6, 2H), 3.40-3.58 (m, 18H), 3.23 (s, 3H), 2.97 (bs, 1H), 2.89 (bs, 1H), 2.17 (m, 1H), 1.81 (dt, *J* = 6, 1H) 1.40 (d, *J* = 8, 1H), 1.28 (m, 2H). ^{13}C NMR (101 MHz, DMSO-d_6) δ 175.24, 137.92, 136.62, 135.62, 122.61, 119.51 (q, *J* = 323), 71.28, 69.75, 69.72, 69.63, 69.61, 69.57, 69.55, 68.37, 68.18, 68.16, 63.24, 58.07, 54.91, 48.83, 46.10, 45.90, 44.09, 42.47, 41.08,

29.93 (27 signals expected and 26 signals found). HR MS calcd. for $C_{26}H_{43}N_2O_8$ (M - TFSI)$^+$ m/z 511.3011, found m/z 511.3014 (error 0.5 ppm). DSC (5.0 ^oC/min): T_g -56 ^oC. Conductivity at 25 °C = 2.79 x 10^{-4} S/cm.

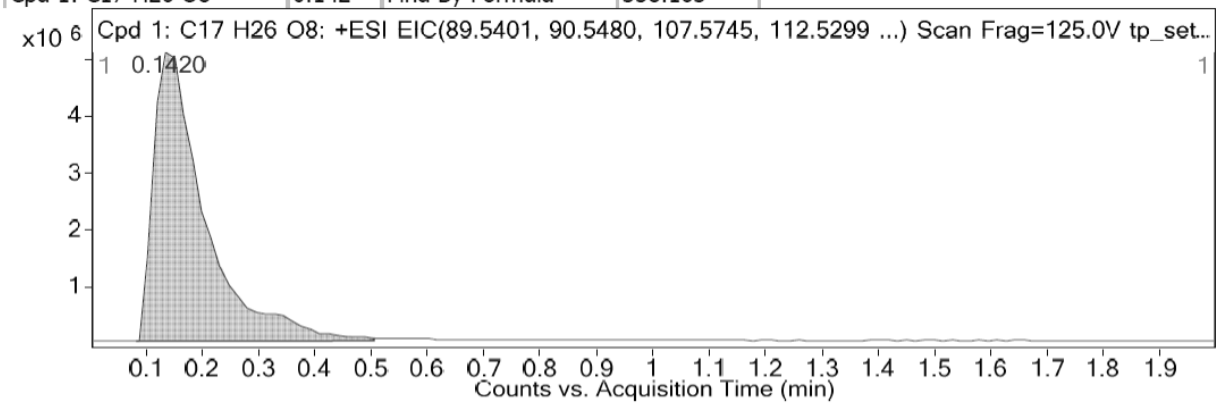
***Exo,Exo*-ONB[C(O)OE$_4$Im$^+$EOMe]$_2$ (TFSI$^-$)$_2$ (18b):** General Procedure 9 using **17b** (1.5 g, 1.8 mmol) and 1-(2'-methoxyethyl)imidazole (**6b**, 1 g, 6 mmol) afforded the product as a pale yellow oil (1.7 g, 72%). ^{1}H-NMR (acetone-d_6, 400 MHz): δ 2.85 (s, 2H), 3.29 (s, 6H), 3.49 (t, J = 4Hz, 4H), 3.59-3.68 (m, 24H), 3.90-3.94 (q, J = 4 Hz, 8H), 4.09-4.30 (m, 4H), 4.52 (t, J = 4Hz, 8H), 5.20 (s, 2H), 6.51 (s, 2H), 7.75 (d, 4H), 9.03 (s, 2H). ^{13}C-NMR (acetone-d_6, 101 MHz): δ 46.6, 49.6, 49.6, 57.9, 63.9, 68.5, 68.6, 69.9, 70.0, 70.2, 70.3, 71.52 80.5, 120.1 (q, J = 323 Hz), 122.8, 122.9, 136.6, 136.9, 171.5 (19 peaks observed, theory: 19). HR MS: m/z 680.1076 (M + 2 Na)$^{+2}$, calc. for ($C_{40}H_{58}F_{12}N_6Na_2O_{21}S_4$)$^{+2}$ m/z 680.1065 (error 1.6 ppm); m/z 966.2921 [M – TFSI – C_4H_4O (furan)]$^+$, calc. for $C_{34}H_{54}F_6N_5O_{16}S_2$ m/z 966.2906 (error 1.5 ppm); m/z 1034.3204 (M – TFSI)$_+$, calc. for $C_{38}H_{58}F_6N_5O_{17}S_2$ m/z 1034.3168 (error 3.5 ppm); m/z 1337.2256 (M + Na)$^+$, calc. for $C_{40}H_{58}F_{12}N_6NaO_{21}S_4$ m/z 1337.2238 (error 1.3 ppm). T_g (DSC) = -42 ^oC Conductivity at 25 °C = 1.2 x 10^{-4} S/cm.

***Exo,Exo*-ONB[C(O)OE$_4$Im$^+$EO$_2$Me]$_2$ (TFSI$^-$)$_2$ (18c):** General Procedure 9 using ditosylate **17b** (2.02 g, 2.4 mmol) and 1-(2'-(2''-methoxyethoxy)ethyl)imidazole (**6c**, 1.12 g, 6 mmol) yielded the product as a pale yellow oil (2.02 g, 60%). ^{1}H-NMR (acetone-d_6, 400 MHz): δ 2.85 (s, 2H), 3.29 (s, 6H), 3.49 (t, J = 4Hz, 4H), 3.59-3.68 (m, 24H), 3.90-3.94 (q, J = 4 Hz, 8H), 4.09-4.30 (m, 4H), 4.52 (t, J = 4Hz, 8H), 5.20 (s, 2H), 6.51 (s, 2H), 7.75 (d, 4H), 9.03 (s, 2H). ^{13}C-NMR (acetone-d_6, 101 MHz): δ 46.6, 49.6, 49.6,

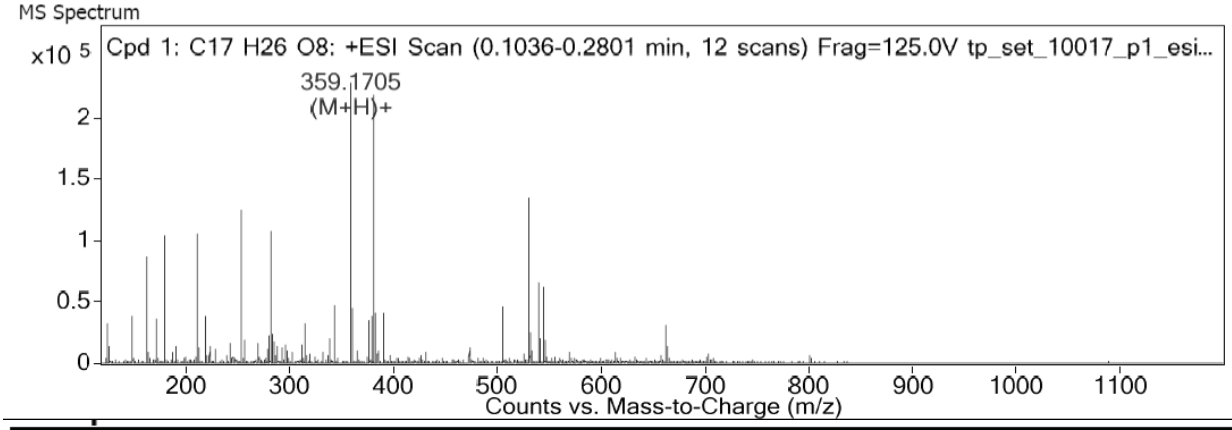
57.9, 63.9, 68.50, 68.6, 69.9, 70.0, 70.2, 70.3, 71.5, 80.5, 120.1 (q, *J* = 323 Hz), 122.8, 122.9, 136.6, 136.9, 171.5 (20 peaks observed, theory: 21). HR MS: m/z 724.1376 (M + 2 Na)$^{+2}$, calc. for $C_{44}H_{66}F_{12}N_6Na_2O_{23}S_4$ m/z 724.1327 (error 6.7 ppm); m/z 1054.3468 [M – TFSI – C_4H_4O (furan)]$^+$, calc. for $C_{38}H_{62}F_6N_5O_{18}S_2$ m/z 1054.3430 (error 3.6 ppm); m/z 1123.3774 (M + H – TFSI)$^+$, calc. for $C_{42}H_{67}F_6N_5O_{19}S_2$ m/z 1123.3770 (error 0.3 ppm); m/z 1425.2805 (M + Na)$^+$, calc. for $C_{44}H_{66}F_{12}N_6NaO_{23}S_4$ m/z 1425.2763 (error 2.9 ppm). T_g (DSC) = -44 ^oC Conductivity at 25 °C = 7.9 x 10^{-5} S/cm.

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C17 H26 O8	0.142	358.163	218452	C17 H26 O8	358.1628	0.76

Compound Label	RT	Algorithm	Mass
Cpd 1: C17 H26 O8	0.142	Find By Formula	358.163



MS Spectrum

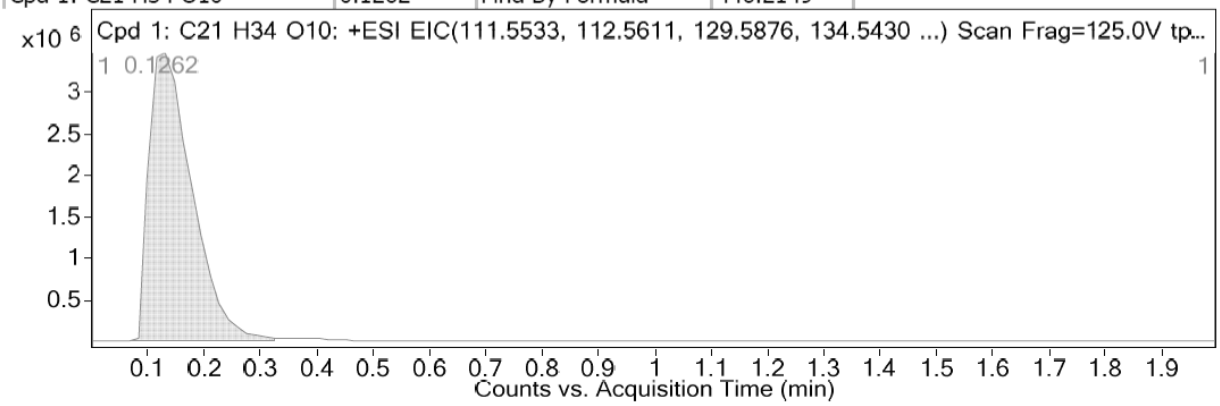


m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
359.1705	359.17	1.14		228136	C17 H27 O8	(M+H)+
359.3366				5304		
360.1741	360.1735	1.78		45706	C17 H27 O8	(M+H)+
361.1728	361.1756	-7.81		10007	C17 H27 O8	(M+H)+
376.1961	376.1966	-1.27	1	34891	C17 H30 N O8	(M+NH4)+
377.2005	377.1999	1.51	1	6870	C17 H30 N O8	(M+NH4)+
378.1926	378.2021	-24.94	1	2479	C17 H30 N O8	(M+NH4)+
381.1521	381.152	0.32	1	221096	C17 H26 Na O8	(M+Na)+
382.155	382.1554	-1.09	1	41029	C17 H26 Na O8	(M+Na)+
383.1557	383.1576	-4.86	1	8217	C17 H26 Na O8	(M+Na)+

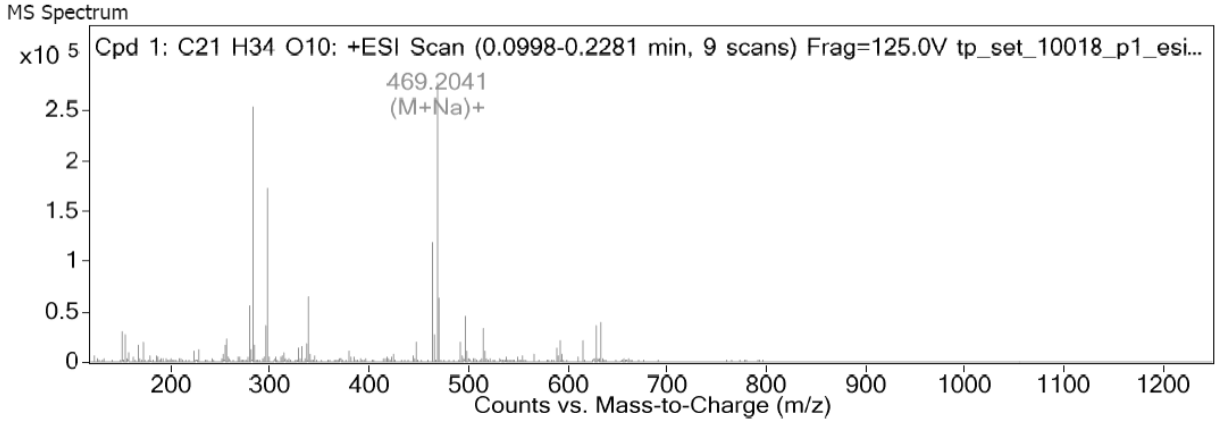
Figure S1. HR MS of norbornene diol NB[C(O)OE$_2$OH]$_2$ (**2a**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C21 H34 O10	0.1262	446.2149	277147	C21 H34 O10	446.2152	-0.69

Compound Label	RT	Algorithm	Mass
Cpd 1: C21 H34 O10	0.1262	Find By Formula	446.2149



MS Spectrum

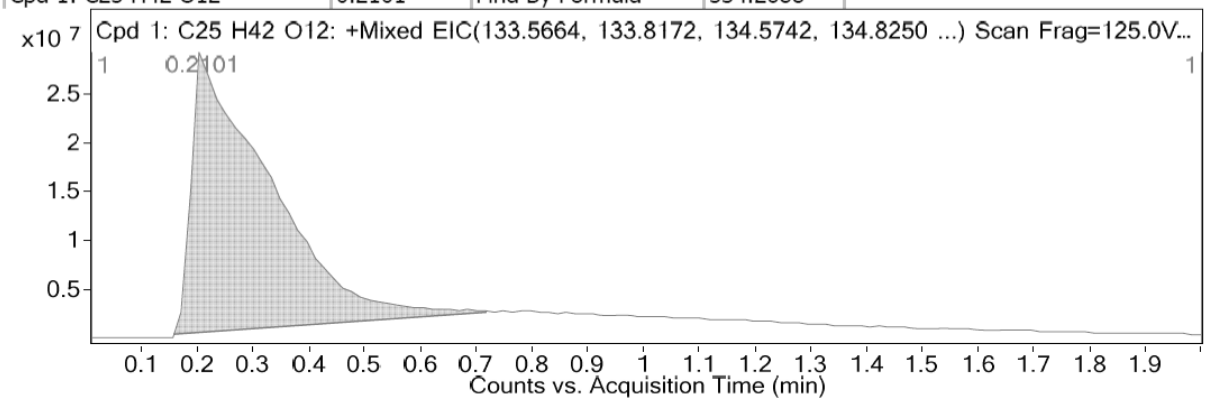


m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
447.2214	447.2225	-2.33	1	18918	C21 H35 O10	(M+H)+
448.2257	448.2259	-0.48	1	5484	C21 H35 O10	(M+H)+
464.2483	464.249	-1.5	1	118652	C21 H38 N O10	(M+NH4)+
464.2483				118652		
465.2512	465.2523	-2.48		27645	C21 H38 N O10	(M+NH4)+
466.2532	466.2546	-3.11		5515	C21 H38 N O10	(M+NH4)+
469.2041	469.2044	-0.59		285687	C21 H34 Na O10	(M+Na)+
469.3984				4670		
470.2071	470.2078	-1.51		64200	C21 H34 Na O10	(M+Na)+
471.2092	471.2101	-1.99		12451	C21 H34 Na O10	(M+Na)+

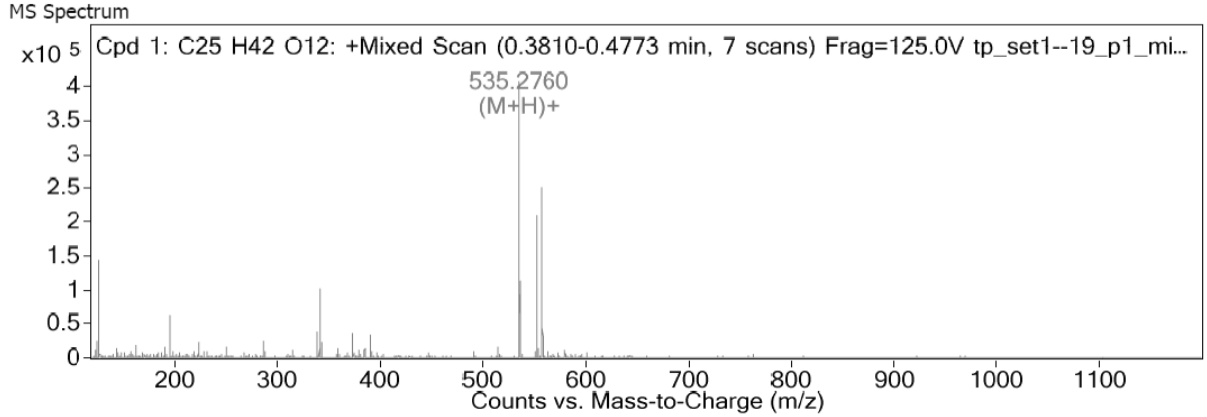
Figure S2. HR MS of norbornene diol NB[C(O)OE$_3$OH]$_2$ (**2b**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C25 H42 O12	0.2101	534.2688	406115	C25 H42 O12	534.2676	2.26

Compound Label	RT	Algorithm	Mass
Cpd 1: C25 H42 O12	0.2101	Find By Formula	534.2688



MS Spectrum



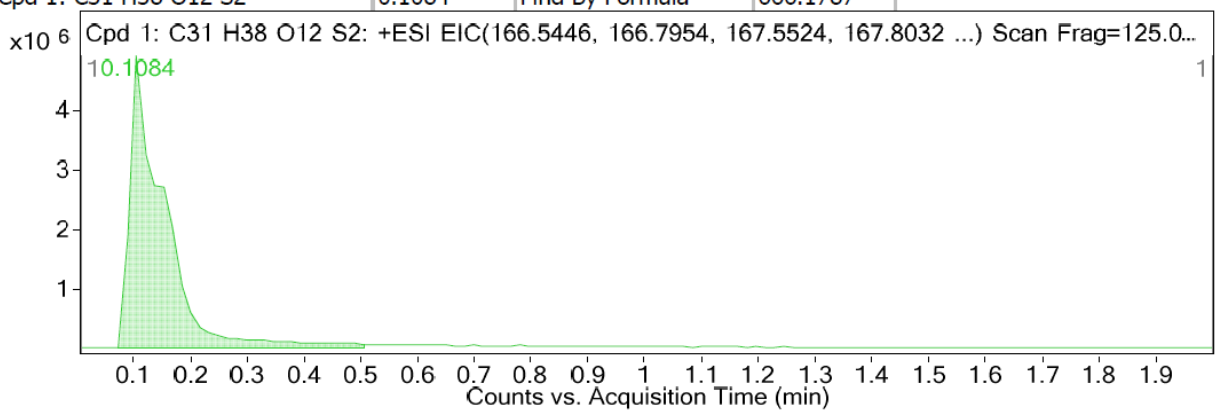
MS Spectrum Peak List

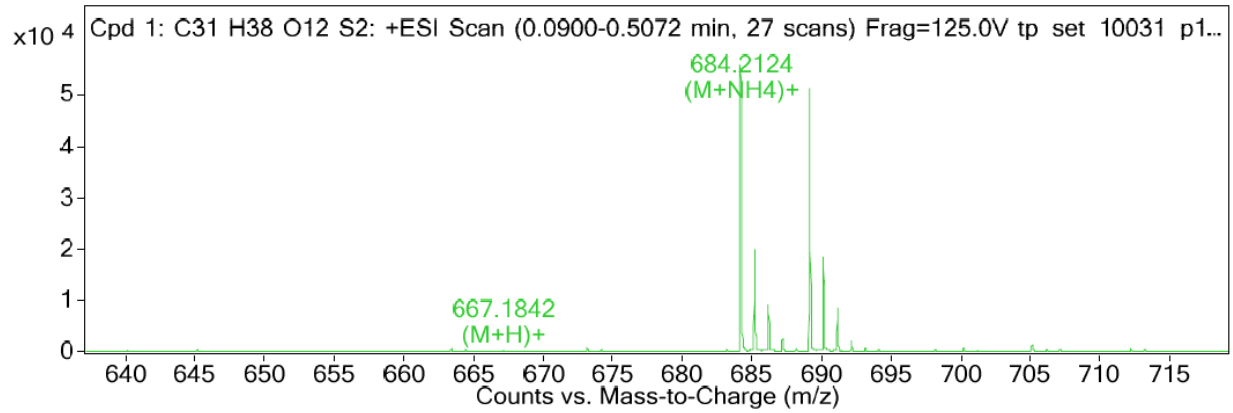
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
535.276	535.2749	2.09		408918	C25 H43 O12	(M+H)+
535.4765				9330		
536.2787	536.2783	0.78		111560	C25 H43 O12	(M+H)+
537.2806	537.2807	-0.21		24150	C25 H43 O12	(M+H)+
552.3026	552.3015	2.16	1	210251	C25 H46 N O12	(M+NH4)+
553.3053	553.3048	0.97	1	56189	C25 H46 N O12	(M+NH4)+
554.308	554.3072	1.53	1	12312	C25 H46 N O12	(M+NH4)+
557.2585	557.2568	3	1	253006	C25 H42 Na O12	(M+Na)+
558.2614	558.2603	1.97	1	70128	C25 H42 Na O12	(M+Na)+
559.2637	559.2627	1.9	1	14824	C25 H42 Na O12	(M+Na)+

Figure S3. HR MS of norbornene diol NB[C(O)OE$_4$OH]$_2$ (**2c**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C31 H38 O12 S2	0.1084	666.1787	51437	C31 H38 O12 S2	666.1805	-2.69

Compound Label	RT	Algorithm	Mass
Cpd 1: C31 H38 O12 S2	0.1084	Find By Formula	666.1787





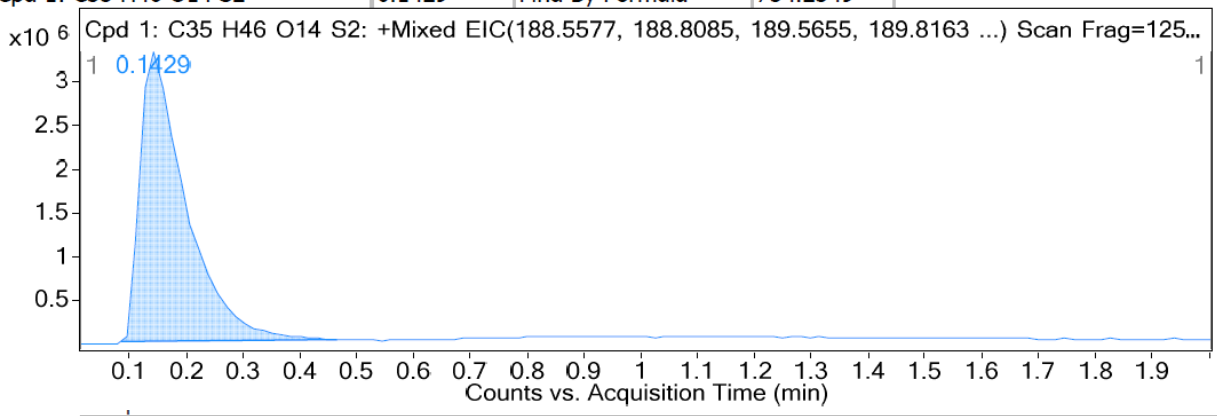
MS Spectrum Peak List

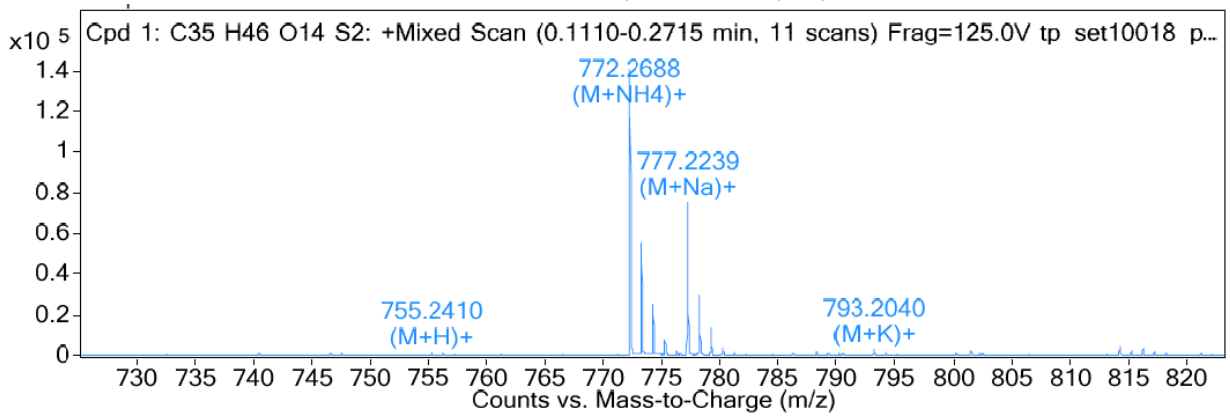
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
407.1152				102884		
408.118				23081		
409.1155				7713		
667.1842	667.1877	-5.28	1	336	C31 H39 O12 S2	(M+H)+
684.2124	684.2143	-2.81	1	56077	C31 H42 N O12 S2	(M+NH4)+
685.2151	685.2175	-3.5	1	19977	C31 H42 N O12 S2	(M+NH4)+
686.2125	686.2151	-3.7	1	9221	C31 H42 N O12 S2	(M+NH4)+
689.1681	689.1697	-2.28	1	52542	C31 H38 Na O12 S2	(M+Na)+
690.1704	690.1729	-3.58	1	18416	C31 H38 Na O12 S2	(M+Na)+
691.1683	691.1705	-3.1	1	8480	C31 H38 Na O12 S2	(M+Na)+

Figure S4. HR MS of norbornene ditosylate NB[C(O)OE$_2$OTs]$_2$ (**3a**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C35 H46 O14 S2	0.1429	754.2349	140378	C35 H46 O14 S2	754.2329	2.64

Compound Label	RT	Algorithm	Mass
Cpd 1: C35 H46 O14 S2	0.1429	Find By Formula	754.2349





MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
755.241	755.2402	1.04	1	1352	C35 H47 O14 S2	(M+H)+
772.2688	772.2667	2.68		141555	C35 H50 N O14 S2	(M+NH4)+
773.2713	773.2699	1.83		55774	C35 H50 N O14 S2	(M+NH4)+
774.2698	774.2681	2.27		25417	C35 H50 N O14 S2	(M+NH4)+
775.2696	775.2694	0.32		7502	C35 H50 N O14 S2	(M+NH4)+
777.2239	777.2221	2.29		76459	C35 H46 Na O14 S2	(M+Na)+
778.2265	778.2254	1.41	1	30384	C35 H46 Na O14 S2	(M+Na)+
779.2249	779.2235	1.83	1	14040	C35 H46 Na O14 S2	(M+Na)+
780.2273	780.2248	3.16	1	4102	C35 H46 Na O14 S2	(M+Na)+
793.204	793.1961	9.97	1	3145	C35 H46 K O14 S2	(M+K)+

Figure S5a. HR MS of norbornene ditosylate NB[C(O)OE$_3$OTs]$_2$ (**3b**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C35 H46 O14 S2	0.1429	754.2349	140378	C35 H46 O14 S2	754.2329	2.64

Compound Label	RT	Algorithm	Mass
Cpd 1: C35 H46 O14 S2	0.1429	Find By Formula	754.2349

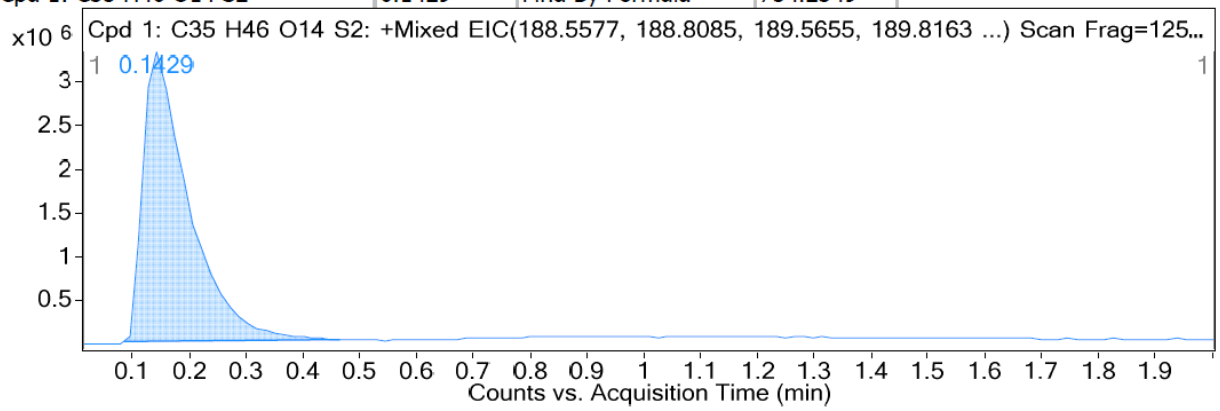
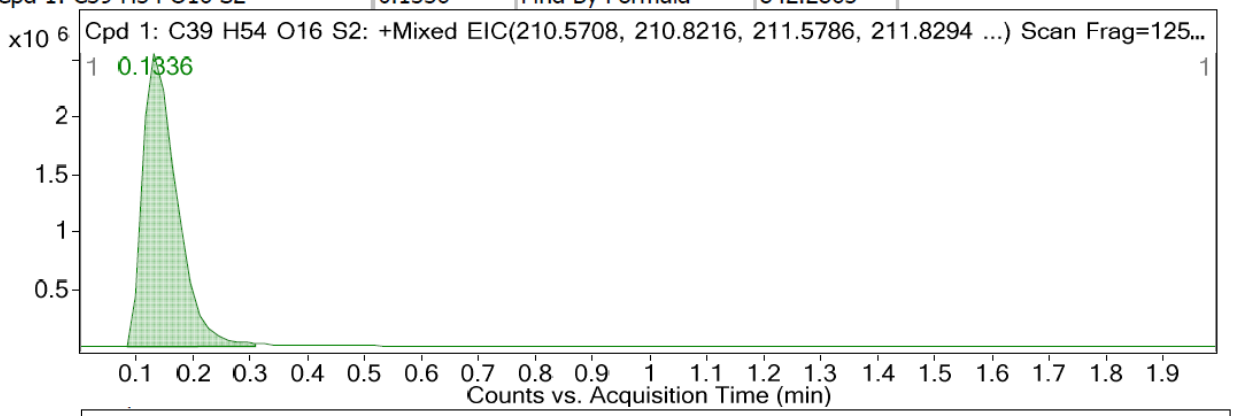
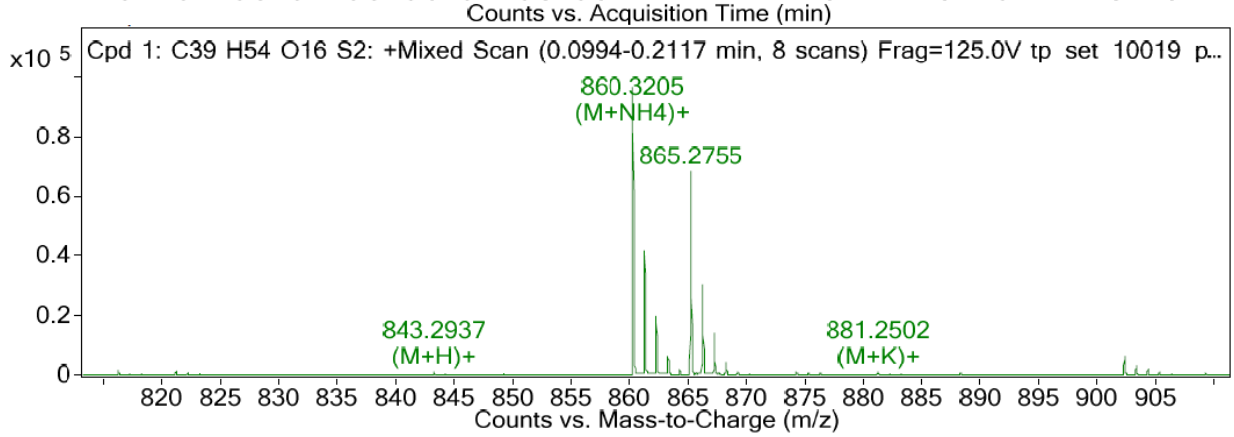


Figure S5b. HR MS of norbornene ditosylate NB[C(O)OE$_3$OTs]$_2$ (**3b**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C39 H54 O16 S2	0.1336	842.2865	96356	C39 H54 O16 S2	842.2853	1.41

Compound Label	RT	Algorithm	Mass
Cpd 1: C39 H54 O16 S2	0.1336	Find By Formula	842.2865





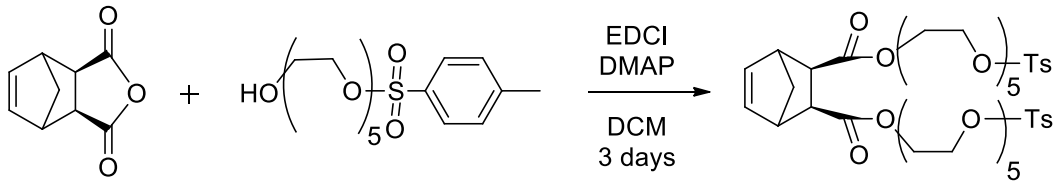
MS Spectrum Peak List

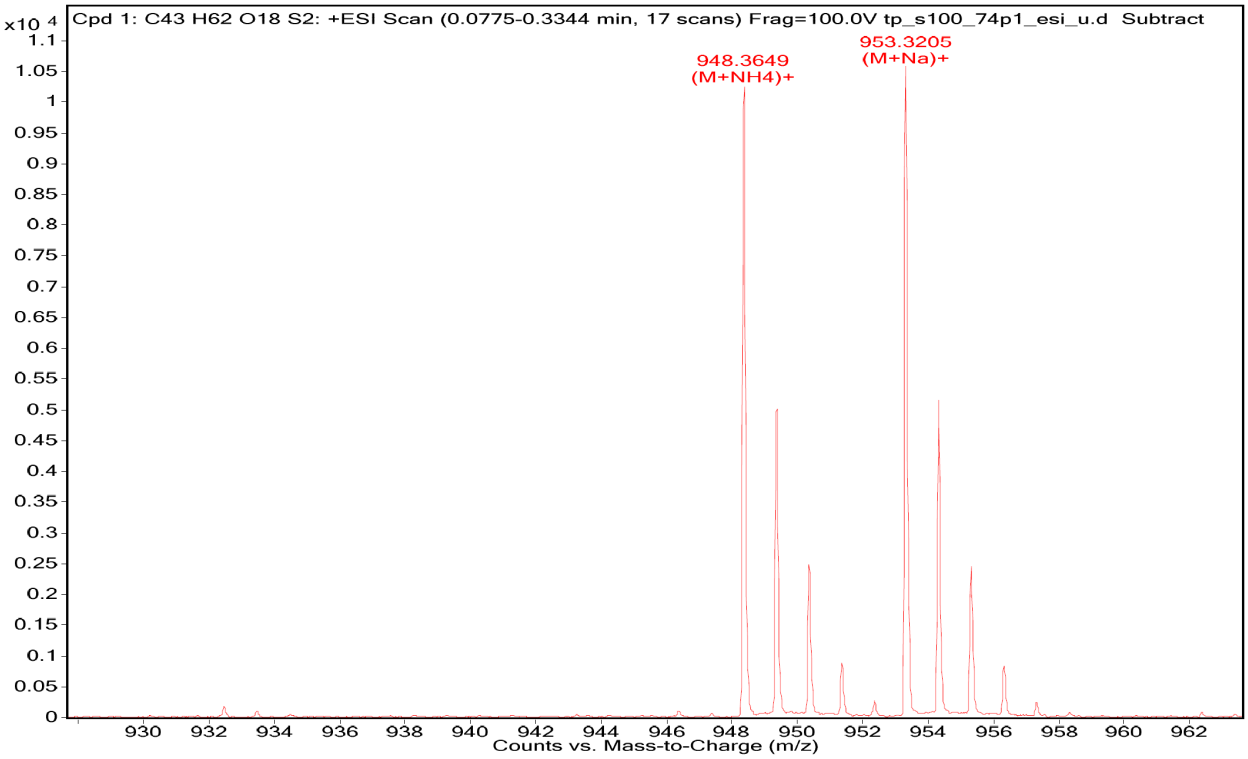
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
843.2937	843.2926	1.35	1	863	C39 H55 O16 S2	(M+H)+
860.3205	860.3192	1.55		96950	C39 H58 N O16 S2	(M+NH4)+
861.3233	861.3224	1.13		42661	C39 H58 N O16 S2	(M+NH4)+
862.3218	862.321	0.96		19913	C39 H58 N O16 S2	(M+NH4)+
863.322	863.3223	-0.25		6073	C39 H58 N O16 S2	(M+NH4)+
865.2755				69013		
865.2755	865.2745	1.08	1	69013	C39 H54 Na O16 S2	(M+Na)+
866.278	866.2778	0.19	1	30492	C39 H54 Na O16 S2	(M+Na)+
867.2761	867.2764	-0.34	1	14324	C39 H54 Na O16 S2	(M+Na)+
881.2502	881.2485	1.98	1	1190	C39 H54 K O16 S2	(M+K)+

High res MS: calc. for $C_{39}H_{54}O_{16}S_2$ [M]+: m/z 842.2853; found: m/z 842.2865 (error 1.4 ppm)

Figure S6. HR MS of norbornene ditosylate NB[C(O)OE$_4$OTs]$_2$ (**3c**).

3d





HR MS: calc. for $C_{43}H_{62}O_{18}S_2$ $[M + NH_4]^+$: m/z 948.3716; found: m/z 948.3649 (error 7.1 ppm).

Figure S7. HR MS of norbornene ditosylate NB[C(O)OE$_5$OTs]$_2$ (**3d**).

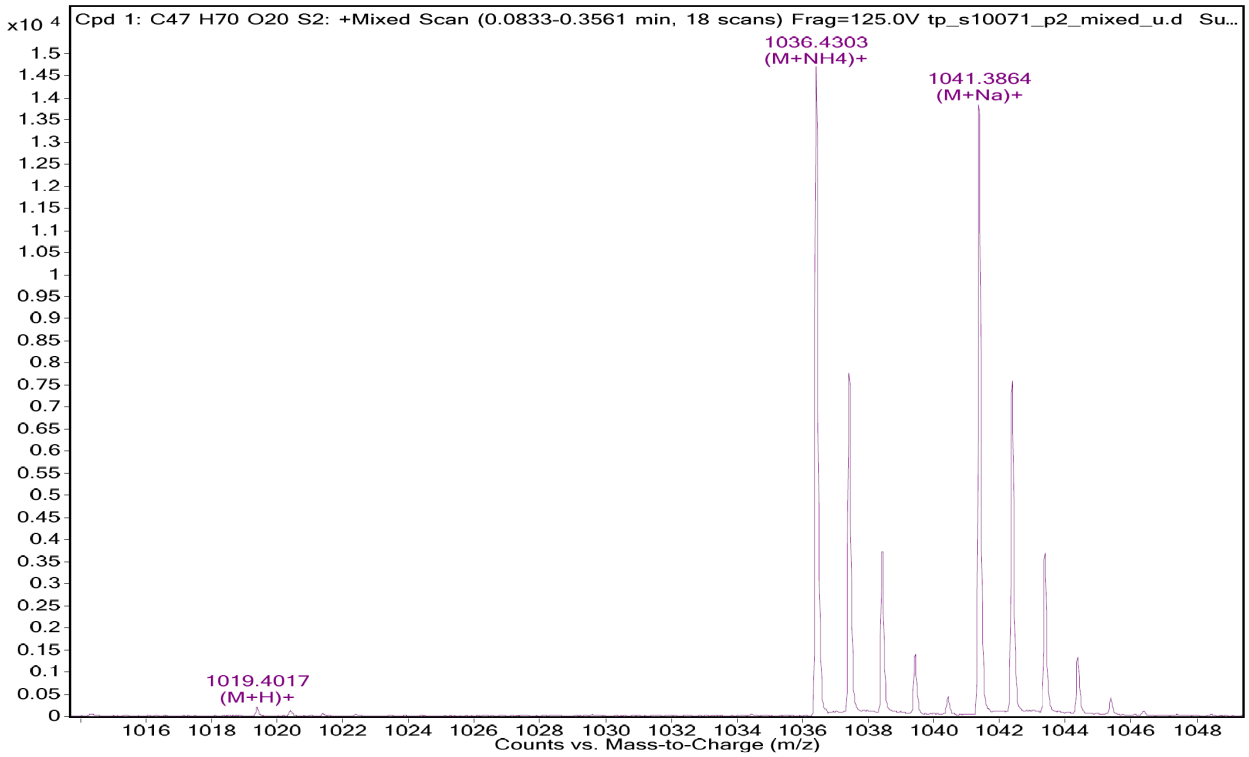
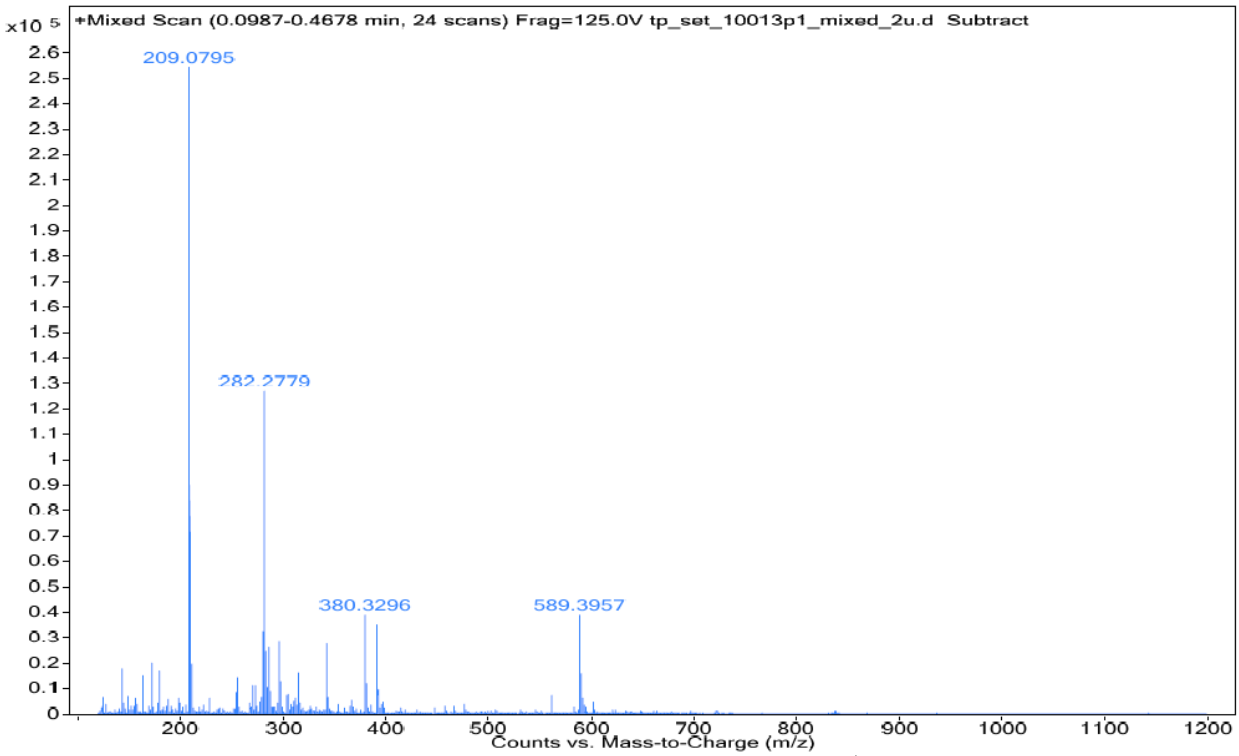
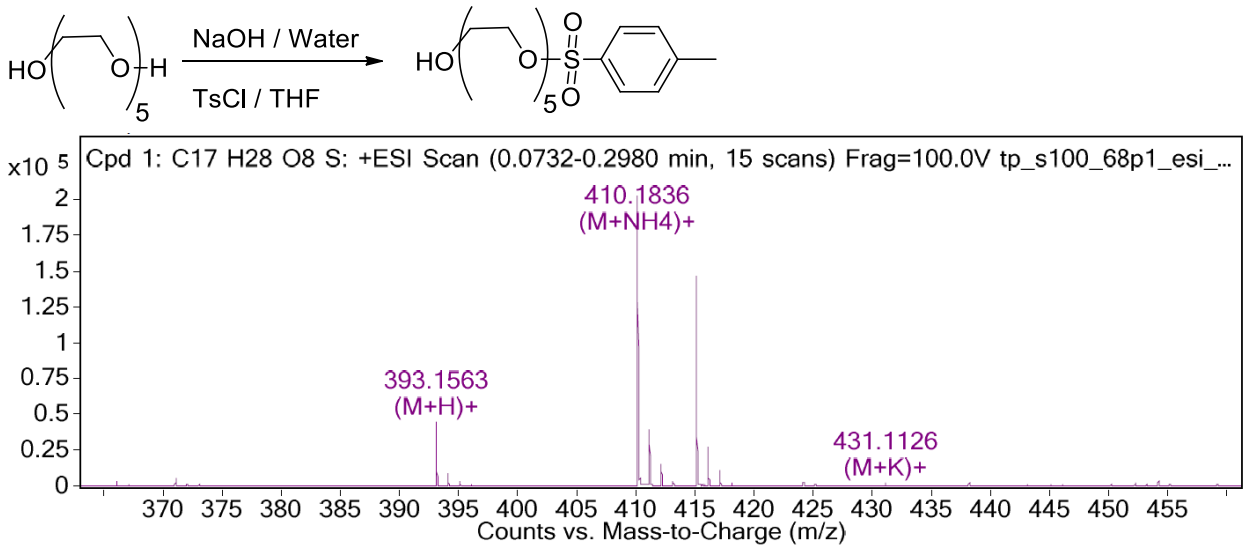


Figure S8. HR MS of norbornene ditosylate NB[C(O)OE$_6$OTs]$_2$ (**3e**).



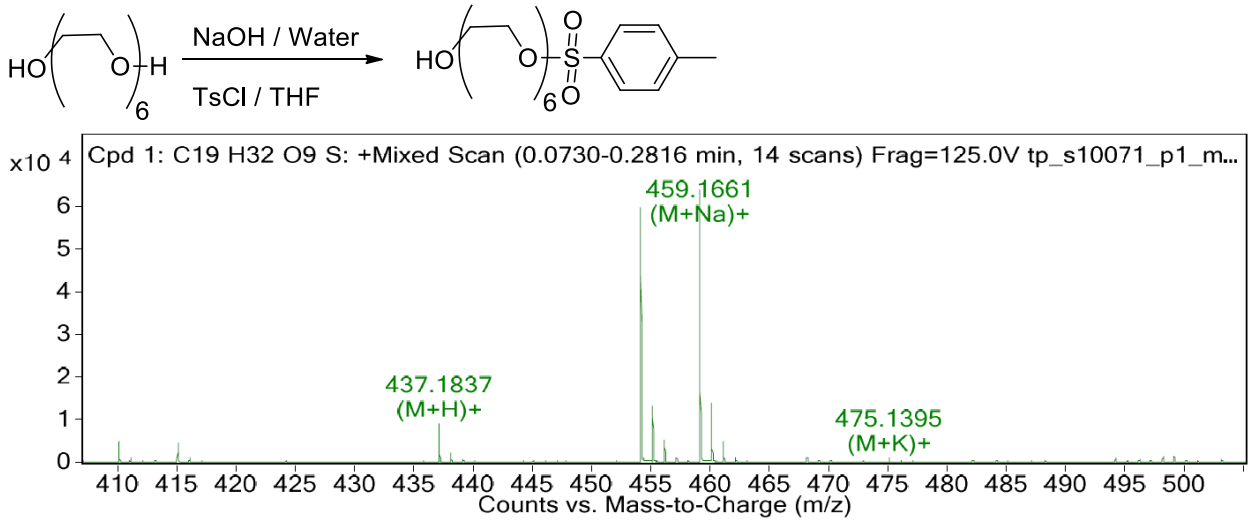
HR MS: calc. for $C_{13}H_{16}Br_2O_4$ fragment $[M - C_2H_4Br_2 + H]^+$: m/z 209.0814; found: m/z 209.0795 (error –9.1 ppm). Calc. for $C_{13}H_{18}Br_2O_4$ $(M + H)^+$ m/z 397.9551; there is an unlabeled peak that seems to correspond to this ion.

Figure S9. HR MS of norbornene dibromide NB[C(O)OEBr]$_2$ (**4**).



HR MS: calc. for $C_{17}H_{28}O_8S$ $[M + NH_4]^+$: m/z 410.1843; found: m/z 410.1836 (error 2 ppm).

Figure S10. HR MS of penta(ethylene glycol) monotosylate HOE_5OTs.

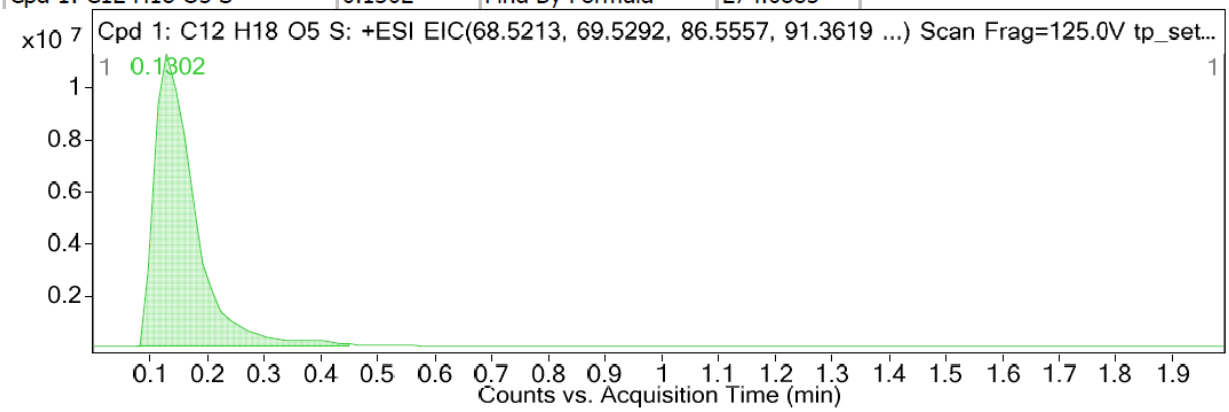


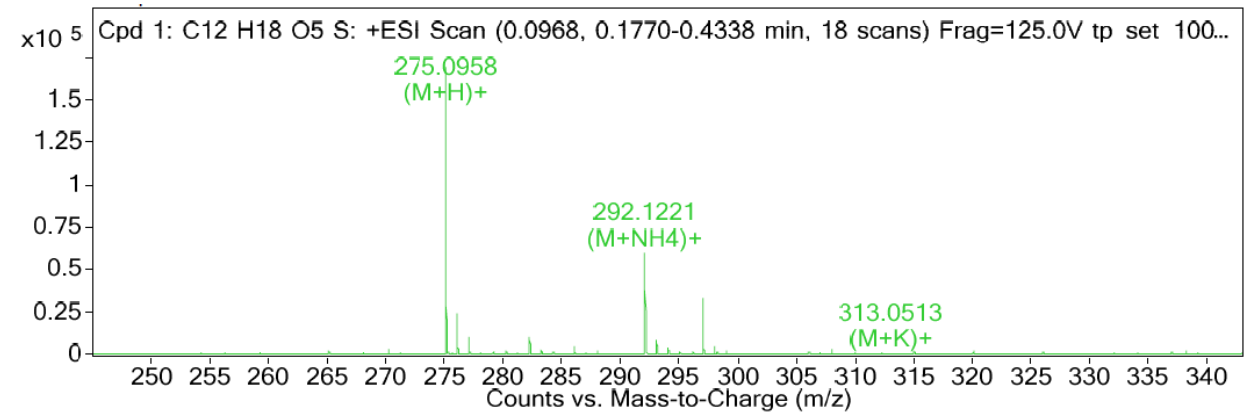
HR MS: calc. for $C_{19}H_{32}O_9S$ $[M + Na]^+$: m/z 459.1659; found: m/z 459.1661 (error –0.4 ppm).

Figure S11. HR MS of hexa(ethylene glycol) monotosylate HOE_6OTs.

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C12 H18 O5 S	0.1302	274.0885	169098	C12 H18 O5 S	274.0875	3.75

Compound Label	RT	Algorithm	Mass
Cpd 1: C12 H18 O5 S	0.1302	Find By Formula	274.0885





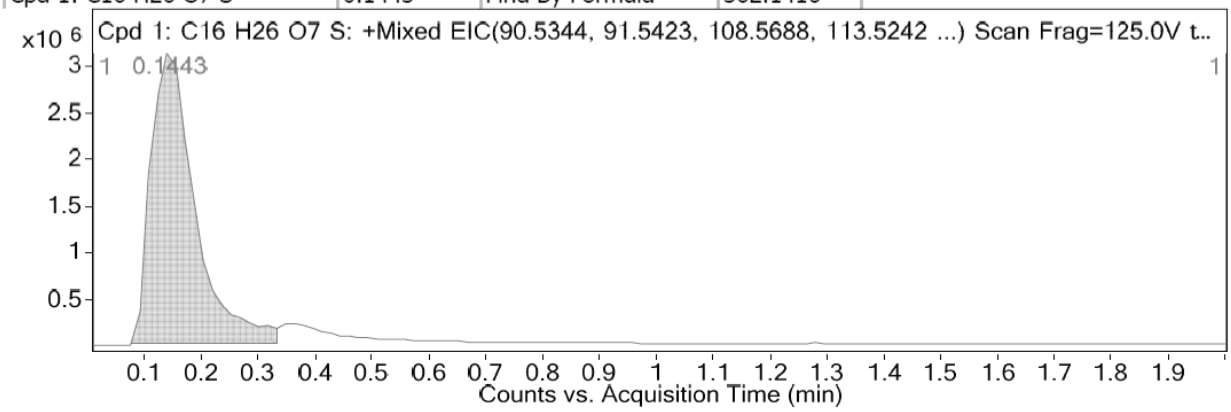
MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
275.0958	275.0948	3.78		174276	C12 H19 O5 S	(M+H)+
275.2414				3690		
276.0987	276.098	2.55		23646	C12 H19 O5 S	(M+H)+
277.0941	277.0934	2.45		9974	C12 H19 O5 S	(M+H)+
292.1221	292.1213	2.76	1	59317	C12 H22 N O5 S	(M+NH4)+
293.1251	293.1244	2.57	1	8180	C12 H22 N O5 S	(M+NH4)+
294.1209	294.12	2.85	1	3538	C12 H22 N O5 S	(M+NH4)+
297.0774	297.0767	2.44	1	33153	C12 H18 Na O5 S	(M+Na)+
298.0806	298.0799	2.19	1	4580	C12 H18 Na O5 S	(M+Na)+
313.0513	313.0507	1.97	1	281	C12 H18 K O5 S	(M+K)+

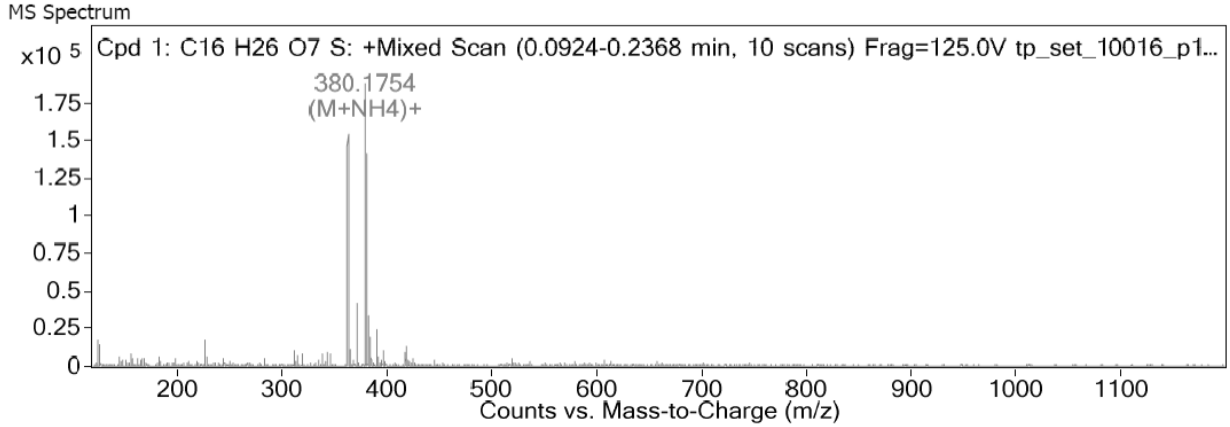
Figure S12. HR MS of di(ethylene glycol) monomethyl ether monotosylate $MeOE_2OTs$ (**5a**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C16 H26 O7 S	0.1443	362.1416	154128	C16 H26 O7 S	362.1399	4.74

Compound Label	RT	Algorithm	Mass
Cpd 1: C16 H26 O7 S	0.1443	Find By Formula	362.1416



MS Spectrum



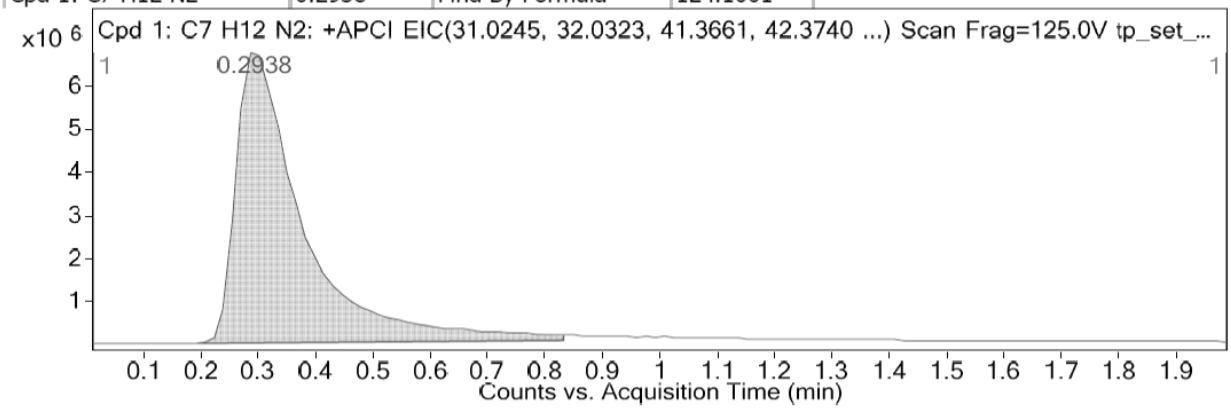
MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
363.149	363.1472	4.94	1	155488	C16 H27 O7 S	(M+H)+
364.152	364.1504	4.39	1	28578	C16 H27 O7 S	(M+H)+
365.149	365.1469	5.67	1	10936	C16 H27 O7 S	(M+H)+
380.1754	380.1737	4.41		187621	C16 H30 N O7 S	(M+NH4)+
380.3307				7685		
381.164				145301		
381.3291				4854		
382.1672				33744		
383.1634				9901		
385.1305	385.1291	3.59		19809	C16 H26 Na O7 S	(M+Na)+

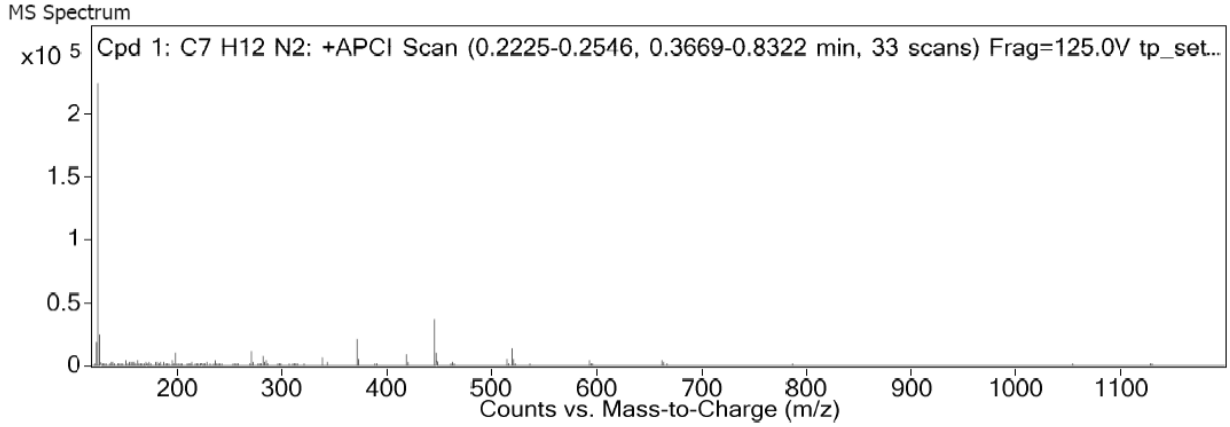
Figure S13. HR MS of tetra(ethylene glycol) monomethyl ether monotosylate $MeOE_4OTs$ (**5c**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C7 H12 N2	0.2938	124.1001	223334	C7 H12 N2	124.1	0.13

Compound Label	RT	Algorithm	Mass
Cpd 1: C7 H12 N2	0.2938	Find By Formula	124.1001



MS Spectrum



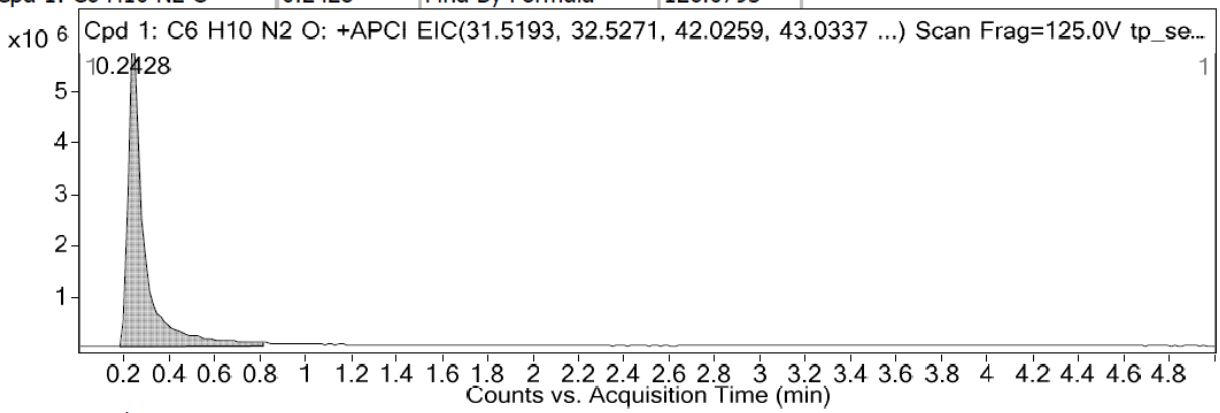
MS Spectrum Peak List

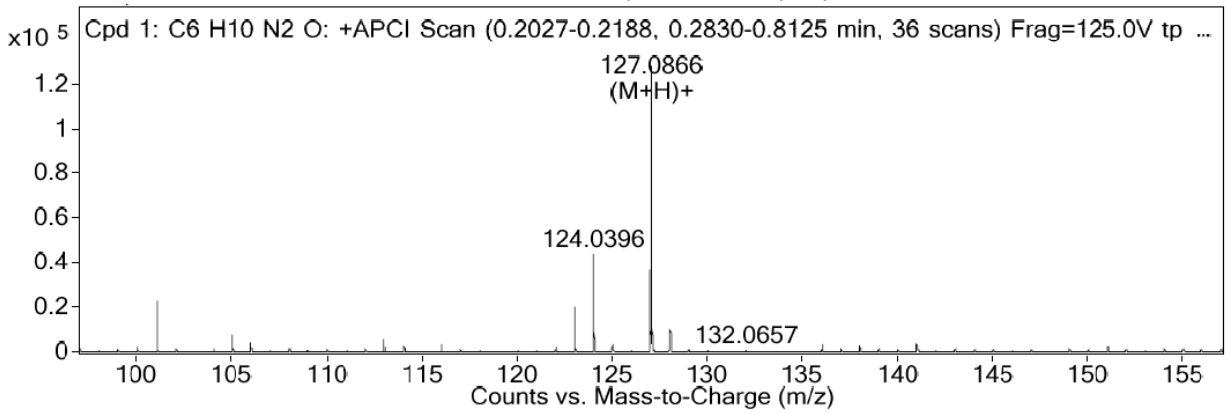
m/z	*Calc m/z*	Diff(ppm)	Abund	Formula	Ion
121.049			1133		
123.0552			18688		
124.0396			46032		
125.0453			3483		
125.1073	125.1073	0.13	226033	C7 H13 N2	(M+H)+
125.2078			4854		
126.1101	126.1102	-0.43	17925	C7 H13 N2	(M+H)+
127.0158			24365		
127.1114	127.113	-12.34	1316	C7 H13 N2	(M+H)+
129.0465			1223		

Figure S14. HR MS of N-substituted imidazole ImBu (**6a**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C6 H10 N2 O	0.2428	126.0793	127875	C6 H10 N2 O	126.0793	-0.08

Compound Label	RT	Algorithm	Mass
Cpd 1: C6 H10 N2 O	0.2428	Find By Formula	126.0793





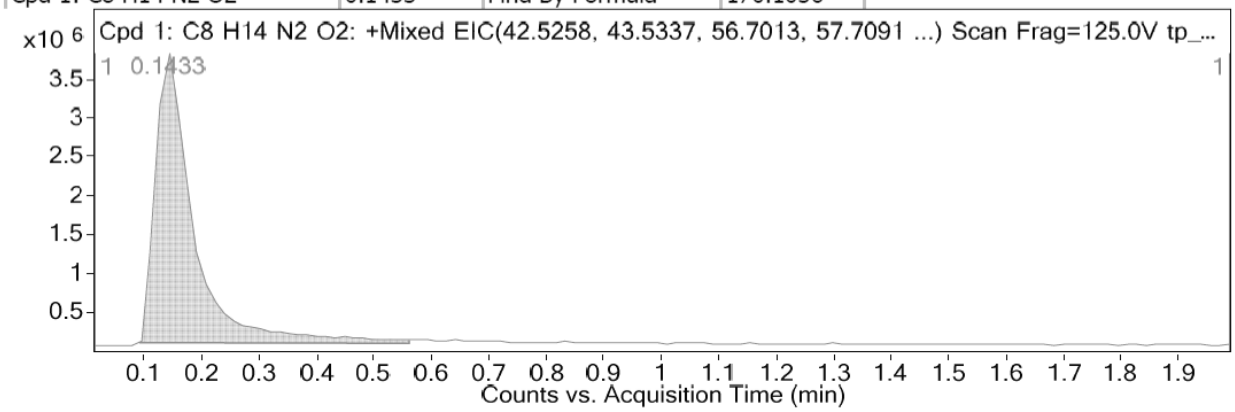
MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	Abund	Formula	Ion
122.094			2320		
123.0553			20319		
124.0396			44103		
125.0441			3196		
125.1045			796		
127.0155			36814		
127.0866	127.0866	-0.08	127988	C6 H11 N2 O	(M+H)+
127.1878			2928		
128.0888	128.0894	-4.26	9471	C6 H11 N2 O	(M+H)+
132.0657			873		

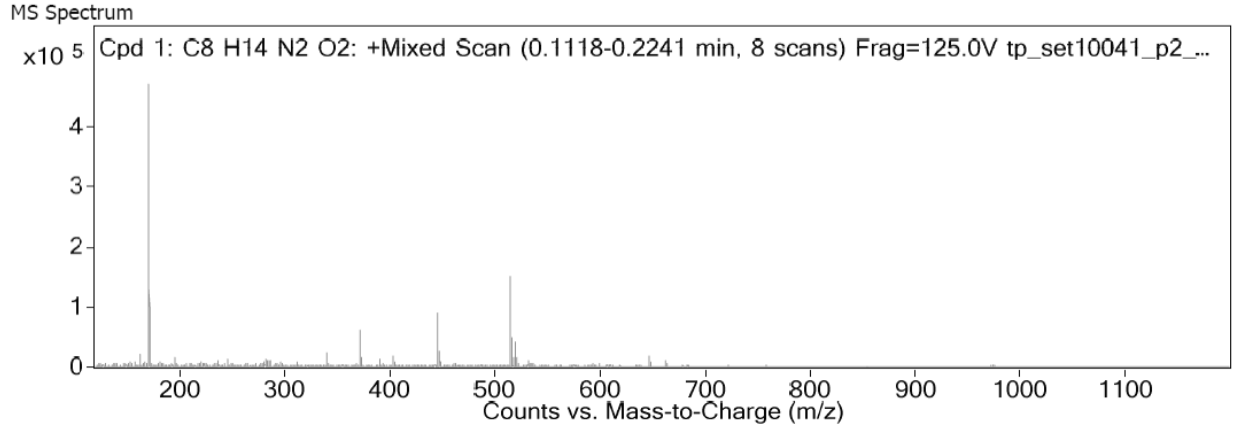
Figure S15. HR MS of N-substituted imidazole ImEOMe (**6b**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C8 H14 N2 O2	0.1433	170.1056	471533	C8 H14 N2 O2	170.1055	0.46

Compound Label	RT	Algorithm	Mass
Cpd 1: C8 H14 N2 O2	0.1433	Find By Formula	170.1056



MS Spectrum



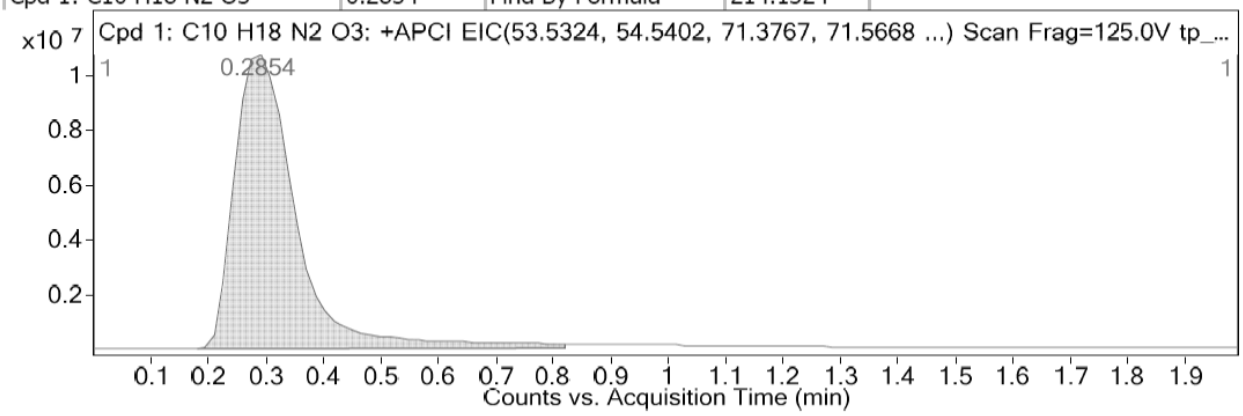
MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	Abund	Formula	Ion
167.1226			7320		
168.1223			1198		
169.1378			5888		
171.1129	171.1128	0.46	473125	C8 H15 N2 O2	(M+H)+
171.2295			15173		
171.2723			2854		
171.3567			1176		
172.1167	172.1157	5.48	43251	C8 H15 N2 O2	(M+H)+
173.11	173.1178	-45.39	5163	C8 H15 N2 O2	(M+H)+
175.0907			3202		

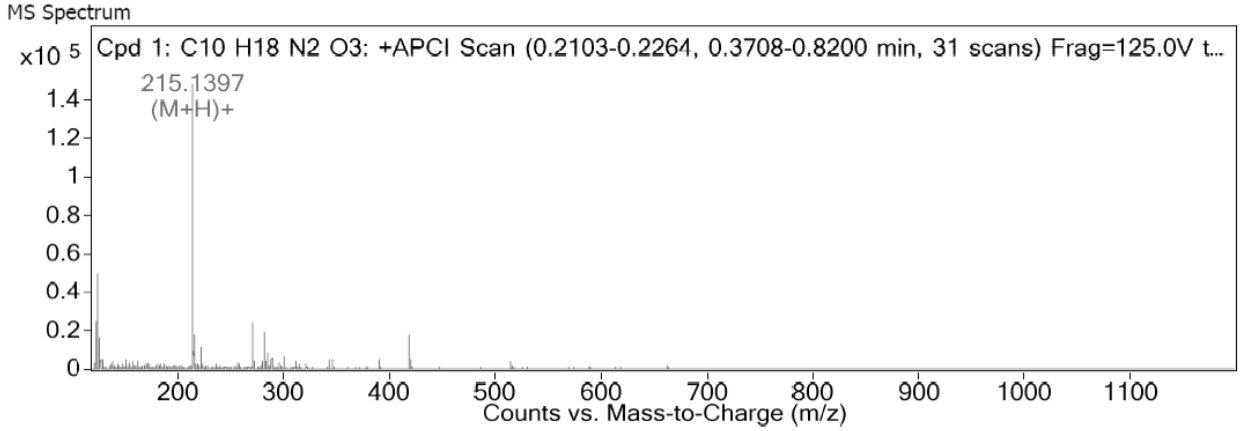
Figure S16. HR MS of N-substituted imidazole ImEO_2Me (**6c**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C10 H18 N2 O3	0.2854	214.1324	147619	C10 H18 N2 O3	214.1317	3.01

Compound Label	RT	Algorithm	Mass
Cpd 1: C10 H18 N2 O3	0.2854	Find By Formula	214.1324



MS Spectrum

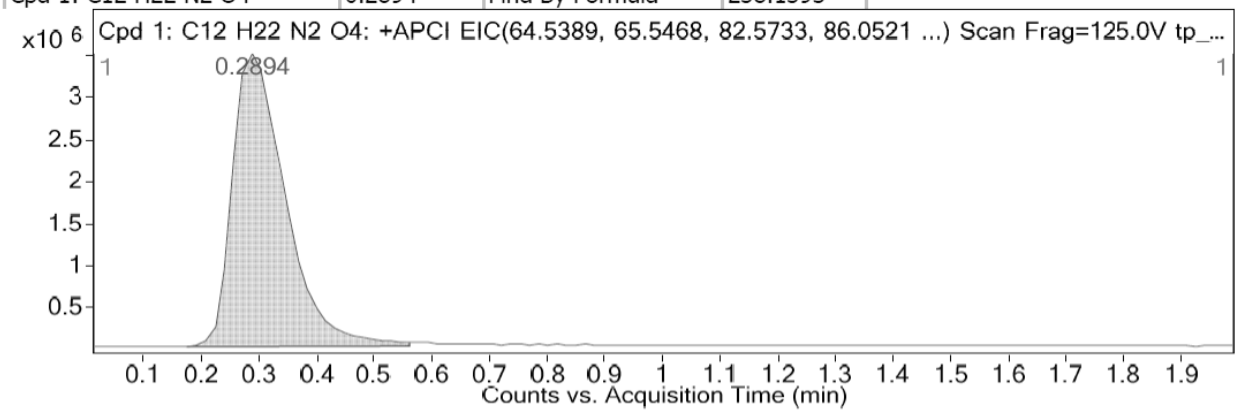


m/z	Calc m/z	Diff(ppm)	Abund	Formula	Ion
211.1281			1376		
212.1221			502		
213.1356			1678		
214.1337			505		
215.1397	215.139	3	151694	C10 H19 N2 O3	(M+H)+
215.2704			2504		
216.1425	216.142	2	17642	C10 H19 N2 O3	(M+H)+
217.1424	217.1442	-8.3	2843	C10 H19 N2 O3	(M+H)+
219.1738			2148		
220.1291			874		

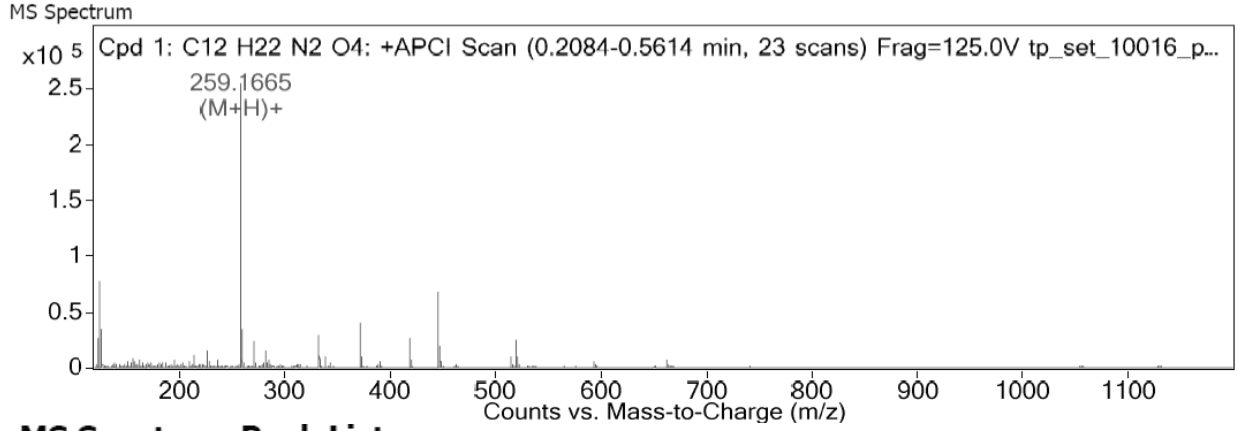
Figure S17. HR MS of N-substituted imidazole $ImEO_3Me$ (**6d**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C12 H22 N2 O4	0.2894	258.1593	254246	C12 H22 N2 O4	258.158	5.04

Compound Label	RT	Algorithm	Mass
Cpd 1: C12 H22 N2 O4	0.2894	Find By Formula	258.1593



MS Spectrum



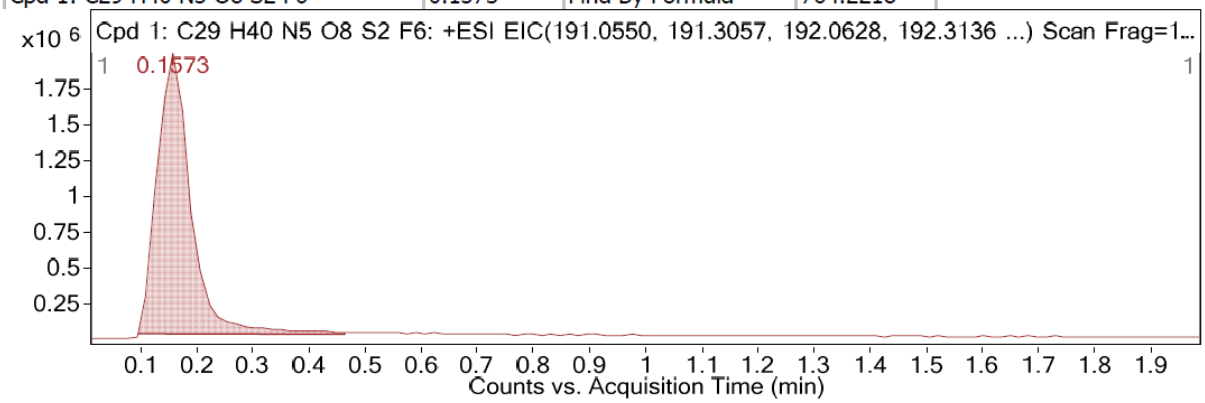
MS Spectrum Peak List

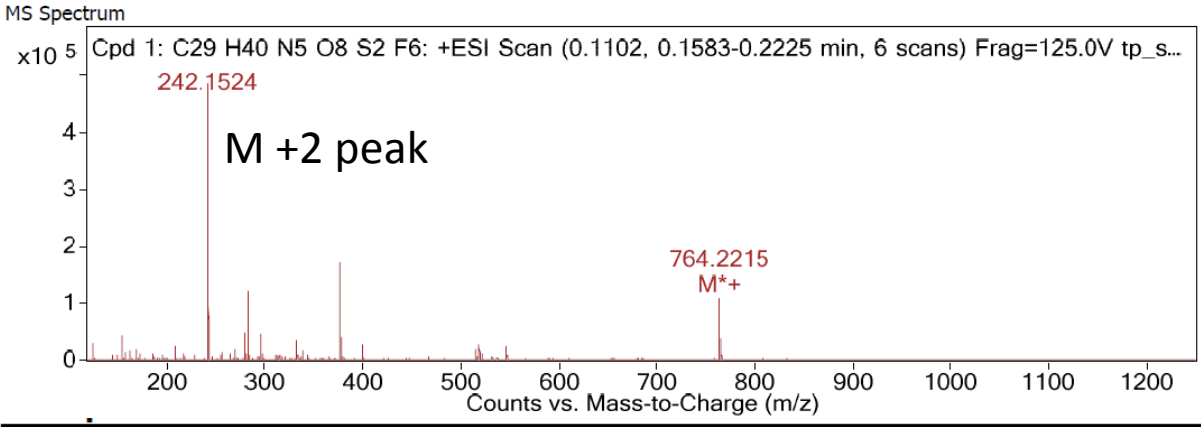
m/z	*Calc m/z*	Diff(ppm)	Abund	Formula	Ion
254.2439			1363		
255.1714			1647		
256.2626			2870		
257.1711			1203		
259.1665	259.1652	5.02	254328	C12 H23 N2 O4	(M+H)+
259.3094			6340		
259.3684			1217		
259.6022			637		
260.1692	260.1683	3.49	34202	C12 H23 N2 O4	(M+H)+
261.1705	261.1705	0.05	4521	C12 H23 N2 O4	(M+H)+

Figure S18. HR MS of N-substituted imidazole $ImEO_4Me$ (**6e**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C29 H40 N5 O8 S2 F6	0.1573	764.2218	106551	C29 H40 N5 O8 S2 F6	764.2222	-0.53

Compound Label	RT	Algorithm	Mass
Cpd 1: C29 H40 N5 O8 S2 F6	0.1573	Find By Formula	764.2218



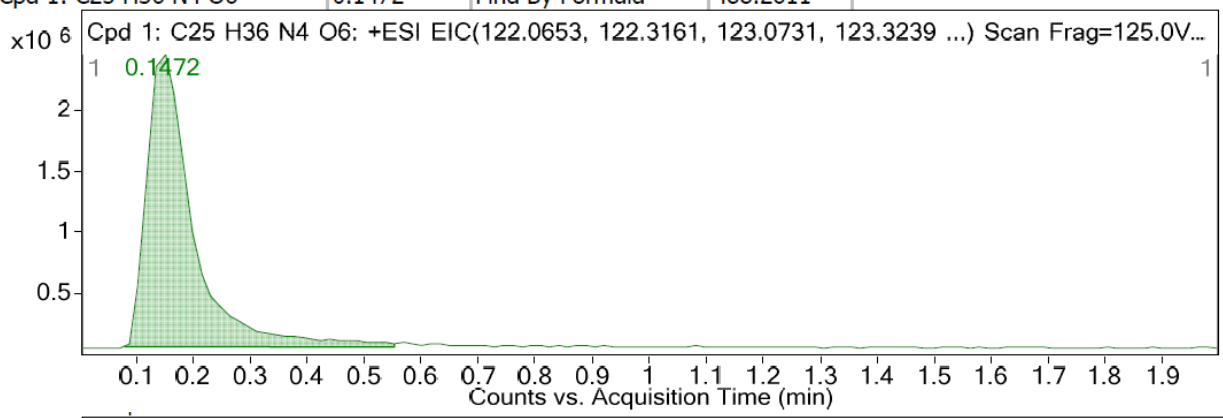


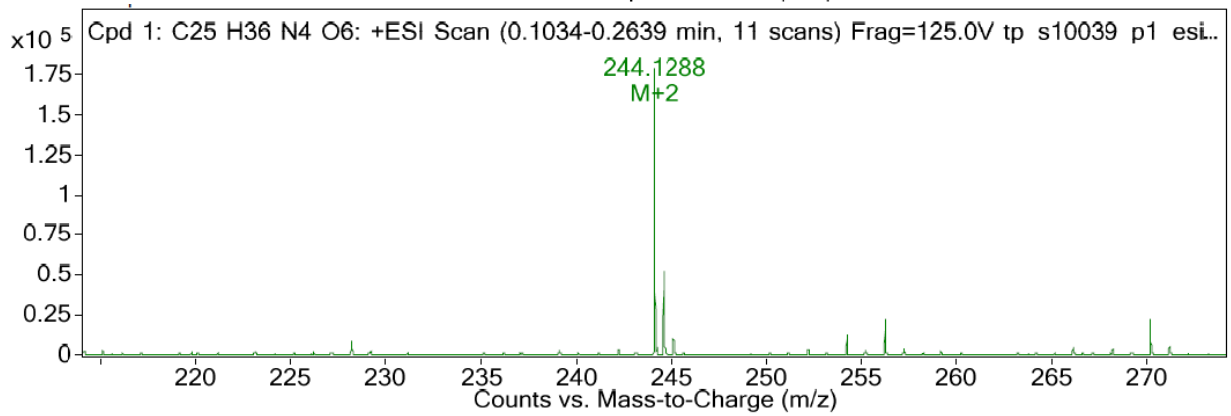
m/z	Calc m/z	Diff(ppm)	z	Abund	Formula	Ion
242.1524				485790		
242.2894				18275		
242.6537				152458		
242.7915				4767		
243.155				27087		
247.1233				4702		
764.2215	764.2217	-0.24	1	107762	C29 H40 N5 O8 S2 F6	M*+
765.2243	765.2246	-0.4	1	36524	C29 H40 N5 O8 S2 F6	M*+
766.2213	766.222	-0.96	1	16298	C29 H40 N5 O8 S2 F6	M*+
767.222	767.2298	-10.18	1	4193	C29 H41 F6 N5 O8 S2	(M+H)+

Figure S19. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OEIm^{+}Bu]$_2$ (TFSI^{-})$_2$ (**8a**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C25 H36 N4 O6	0.1472	488.2611	178684	C25 H36 N4 O6	488.2635	-4.87

Compound Label	RT	Algorithm	Mass
Cpd 1: C25 H36 N4 O6	0.1472	Find By Formula	488.2611





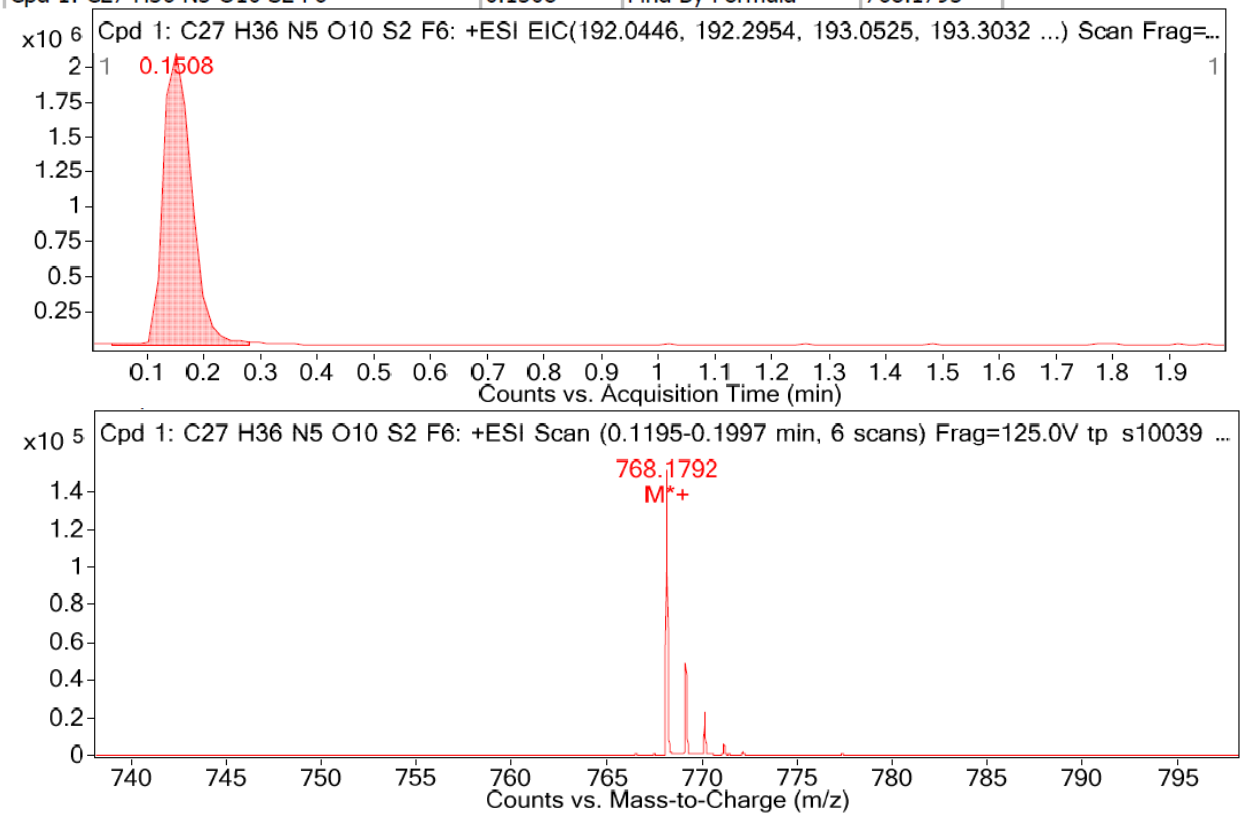
MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
244.1288	244.1312	-9.75	2	178775	C25 H36 N4 O6	M+2
244.6304	244.6327	-9.63	2	52723	C25 H36 N4 O6	M+2
245.1322	245.1341	-7.63	2	9934	C25 H36 N4 O6	M+2
278.2447				4593		
280.2606				54464		
281.2632				10974		
282.2767				181487		
283.2797				36331		
284.2867				17442		
286.0814				5419		

Figure S20a. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OEIm^{+}EOCH$_3$]$_2$ (TFSI^{-})$_2$ (**8b**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C27 H36 N5 O10 S2 F6	0.1508	768.1795	151485	C27 H36 N5 O10 S2 F6	768.1808	-1.64

Compound Label	RT	Algorithm	Mass
Cpd 1: C27 H36 N5 O10 S2 F6	0.1508	Find By Formula	768.1795



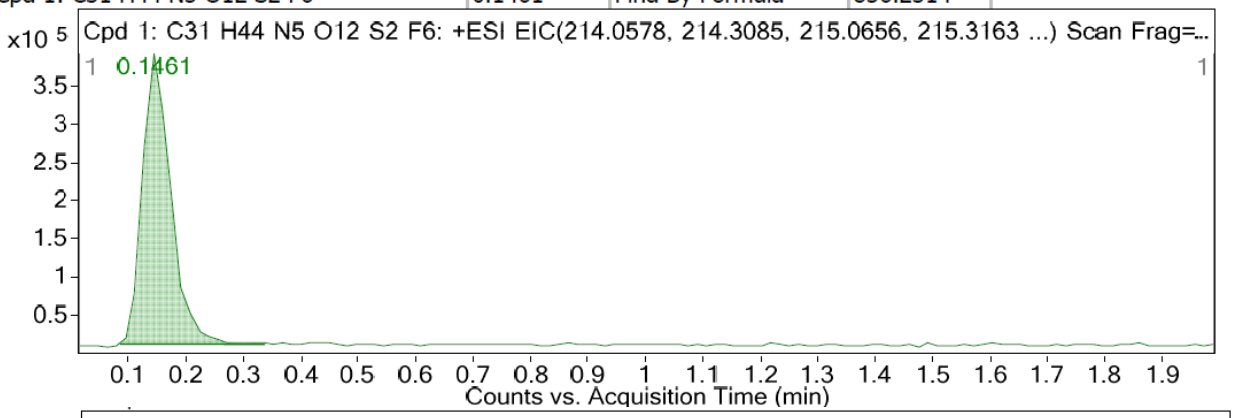
MS Spectrum Peak List

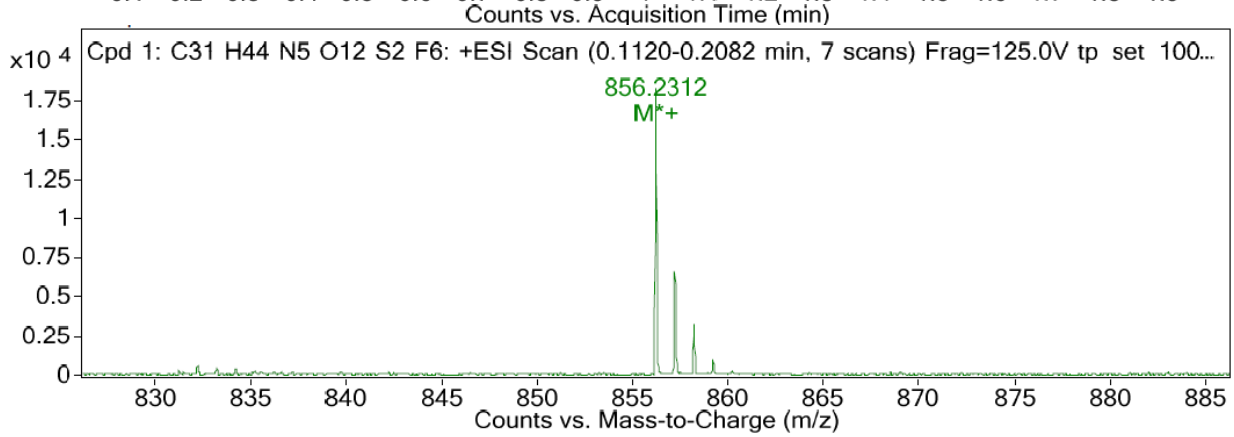
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
239.1266				4420		
242.2605				4009		
244.1288				272965		
244.2672				7146		
244.6303				80608		
245.132				14679		
768.1792	768.1802	-1.34	1	152353	C27 H36 N5 O10 S2 F6	M*+
769.1815	769.1831	-2.1	1	48975	C27 H36 N5 O10 S2 F6	M*+
770.178	770.1804	-3	1	22992	C27 H36 N5 O10 S2 F6	M*+
771.1792	771.1882	-11.64	1	5671	C27 H37 F6 N5 O10 S2	(M+H)+

Figure S20b. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OEIm^{+}EOCH$_3$]$_2$ (TFSI^{-})$_2$ (**8b**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C31 H44 N5 O12 S2 F6	0.1461	856.2314	18289	C31 H44 N5 O12 S2 F6	856.2332	-2.1

Compound Label	RT	Algorithm	Mass
Cpd 1: C31 H44 N5 O12 S2 F6	0.1461	Find By Formula	856.2314





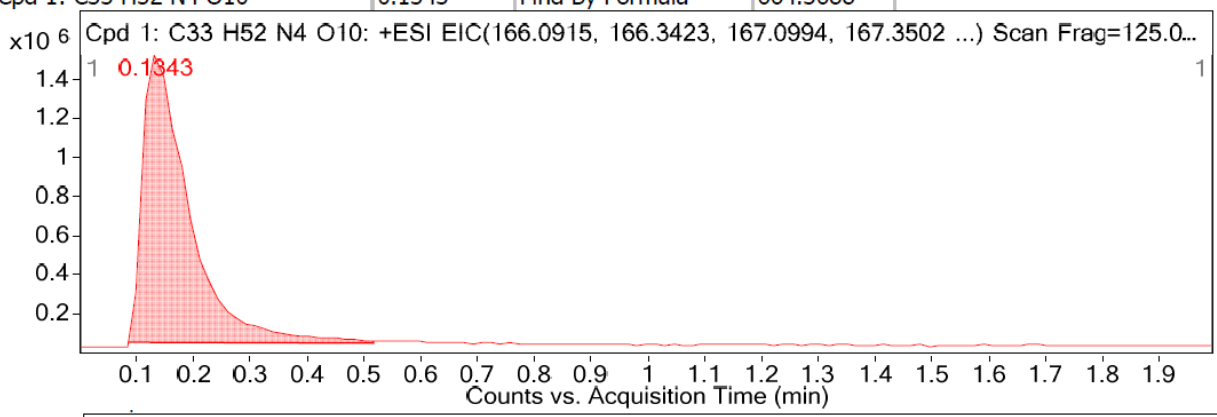
MS Spectrum Peak List

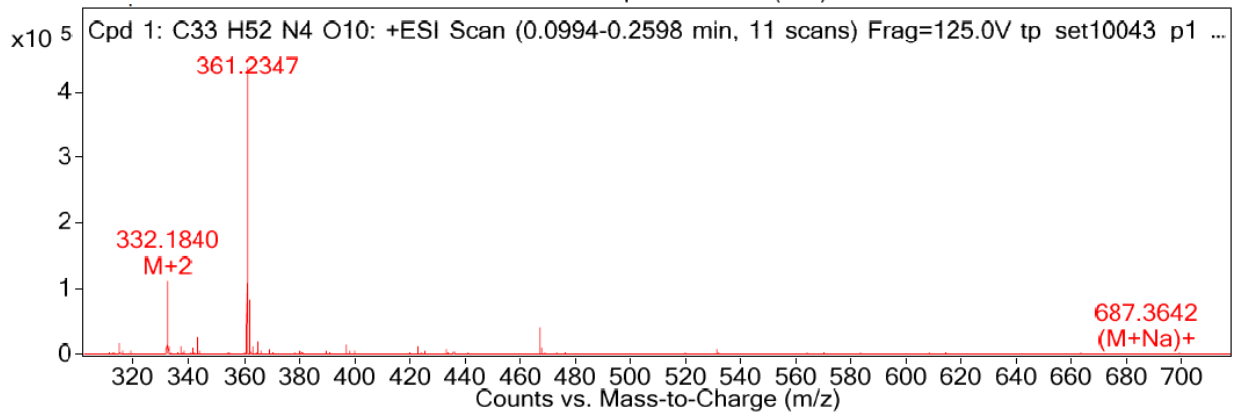
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
278.2468				4968		
279.1639				3884		
280.2629				54533		
281.2661				11430		
282.2791				351986		
282.4273				8685		
283.2819				68439		
284.2776				20474		
856.2312	856.2327	-1.75	1	18362	C31 H44 N5 O12 S2 F6	M*+
857.2338	857.2356	-2.1	1	6602	C31 H44 N5 O12 S2 F6	M*+

Figure S21. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OEIm^{+}EO$_2$CH$_3$]$_2$ (TFSI^{-})$_2$ (**8c**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C33 H52 N4 O10	0.1343	664.3688	111006	C33 H52 N4 O10	664.3683	0.65

Compound Label	RT	Algorithm	Mass
Cpd 1: C33 H52 N4 O10	0.1343	Find By Formula	664.3688





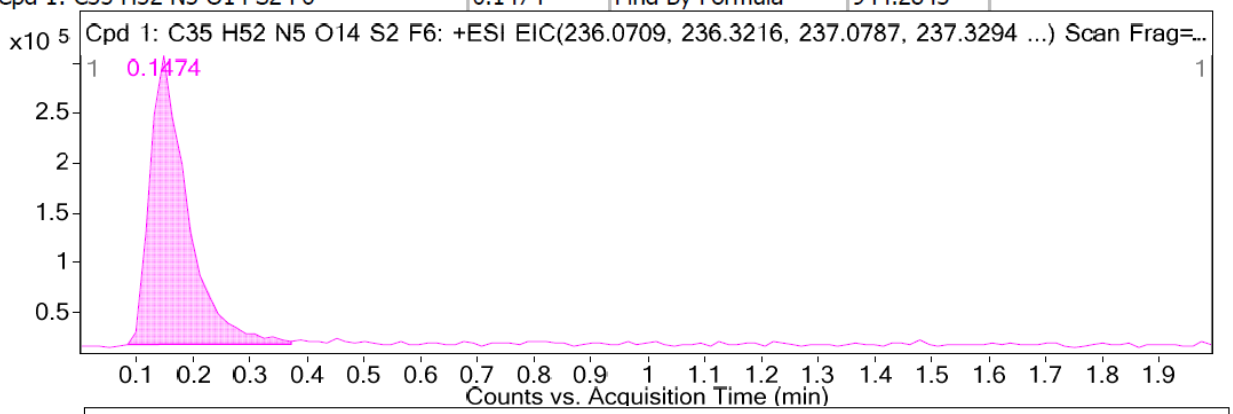
MS Spectrum Peak List

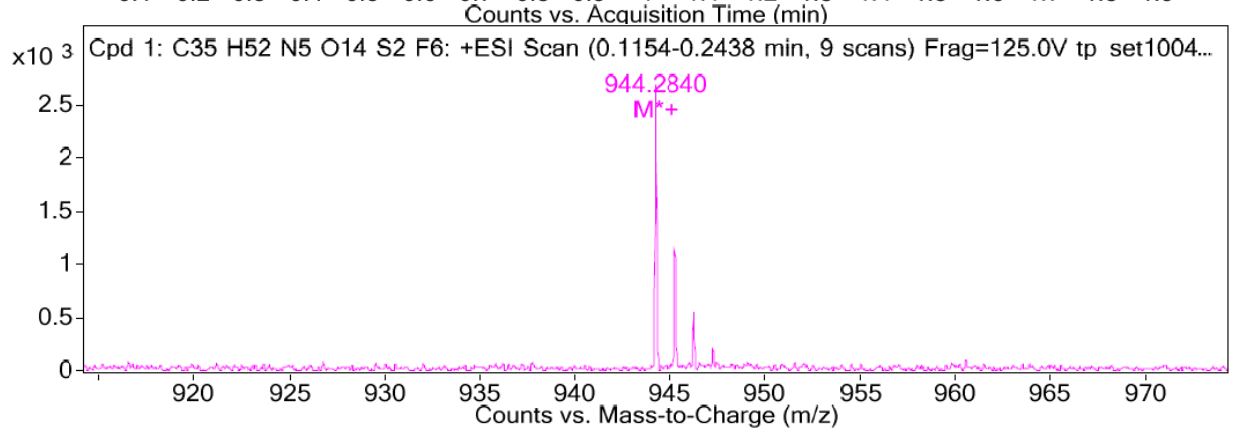
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
332.184	332.1836	1.21	2	112160	C33 H52 N4 O10	M+2
332.6862	332.6852	3.1	2	41584	C33 H52 N4 O10	M+2
333.1854	333.1866	-3.36	2	11027	C33 H52 N4 O10	M+2
361.2347				439541		
361.401				11664		
362.2372				83564		
363.2393				13055		
365.1365				18306		
366.1404				3985		
687.3642	687.3576	9.61	1	187	C33 H52 N4 Na O10	(M+Na)+

Figure S22a. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OEIm^{+}EO$_3$CH$_3$]$_2$ (TFSI^{-})$_2$ (**8d**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C35 H52 N5 O14 S2 F6	0.1474	944.2843	2683	C35 H52 N5 O14 S2 F6	944.2856	-1.46

Compound Label	RT	Algorithm	Mass
Cpd 1: C35 H52 N5 O14 S2 F6	0.1474	Find By Formula	944.2843





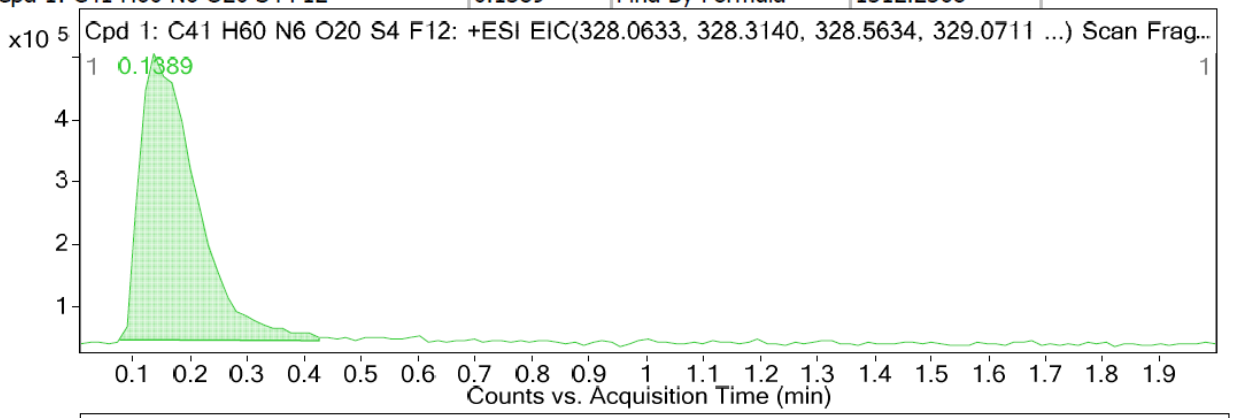
MS Spectrum Peak List

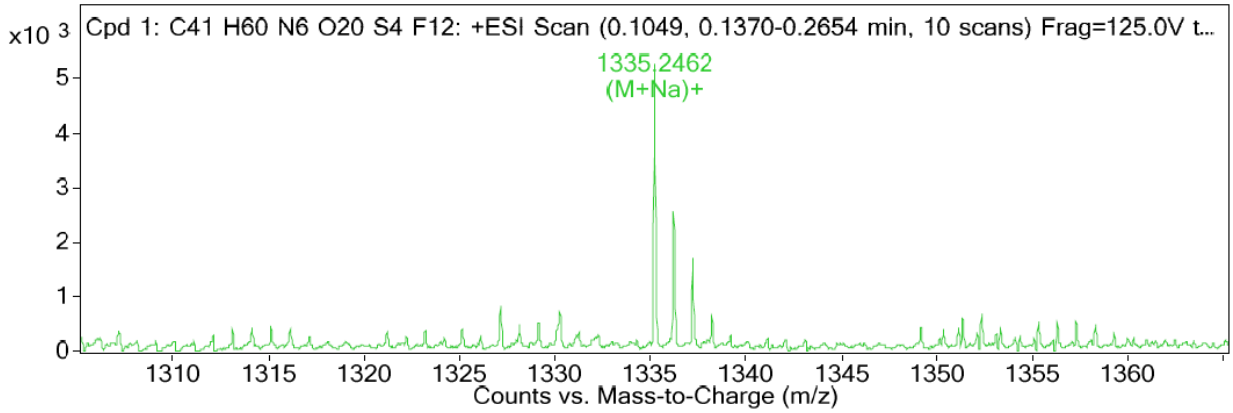
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
360.1819				3765		
361.2348				520676		
361.4009				14062		
361.4659				3066		
361.6677				2901		
362.2373				98980		
363.2394				15404		
365.1366				21197		
366.1405				4594		
944.284	944.2851	-1.13	1	2693	C35 H52 N5 O14 S2 F6	M*+

Figure S22b. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OEIm^{+}EO$_3$CH$_3$]$_2$ (TFSI^{-})$_2$ (**8d**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C41 H60 N6 O20 S4 F12	0.1389	1312.2568	5264	C41 H60 N6 O20 S4 F12	1312.2554	1.07

Compound Label	RT	Algorithm	Mass
Cpd 1: C41 H60 N6 O20 S4 F12	0.1389	Find By Formula	1312.2568



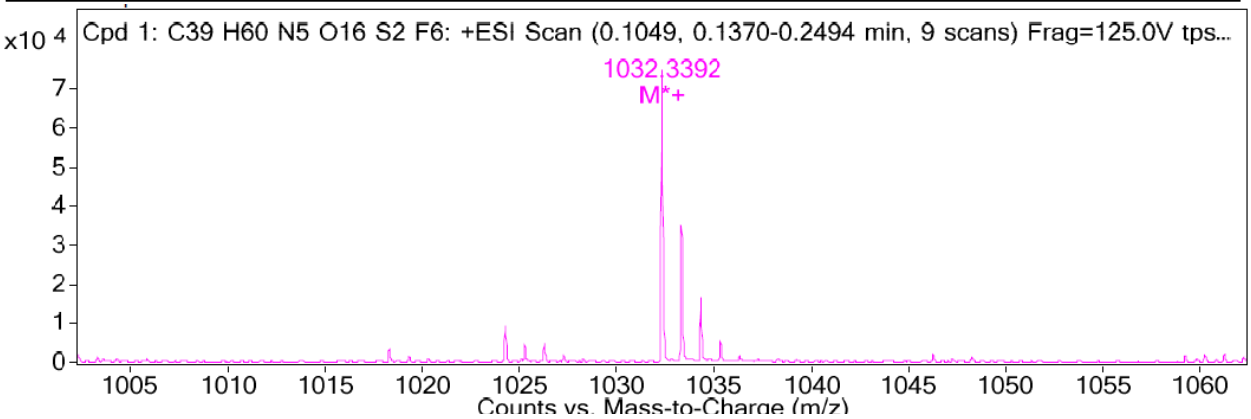


MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
360.1807				60590		
361.1871				20254		
365.1372				375314		
365.3028				10957		
366.1401				79869		
367.1432				12056		
367.2591				7760		
369.2105				14375		
369.3842				68511		
1335.2462	1335.2446	1.21	1	5282	C41 H60 F12 N6 Na O20 S4	(M+Na)+

Figure S23a. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OEIm^{+}EO$_4$CH$_3$]$_2$ (TFSI^{-})$_2$ (**8e**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C39 H60 N5 O16 S2 F6	0.1383	1032.3392	74955	C39 H60 N5 O16 S2 F6	1032.3381	1.09



Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C37 H60 N4 O12	0.1215	752.422	215120	C37 H60 N4 O12	752.4208	1.61

MS Zoomed Spectrum

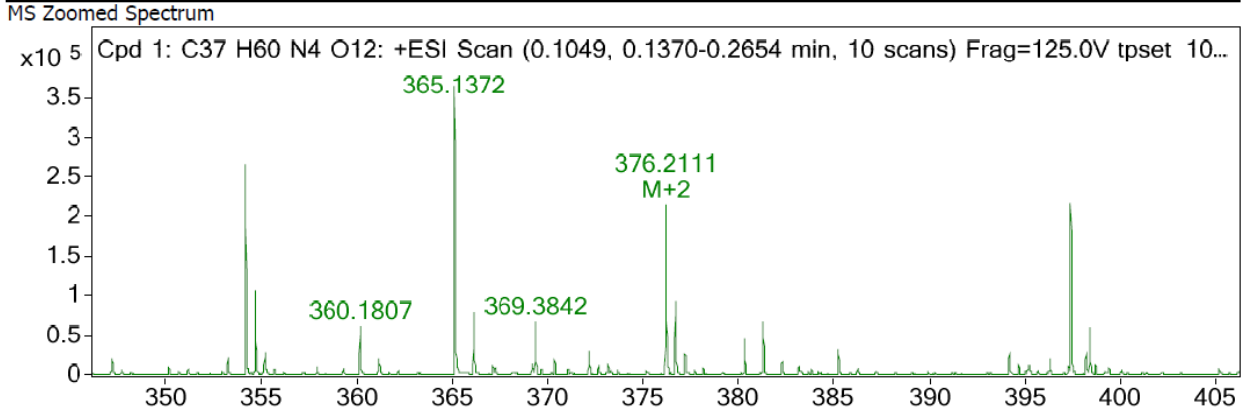
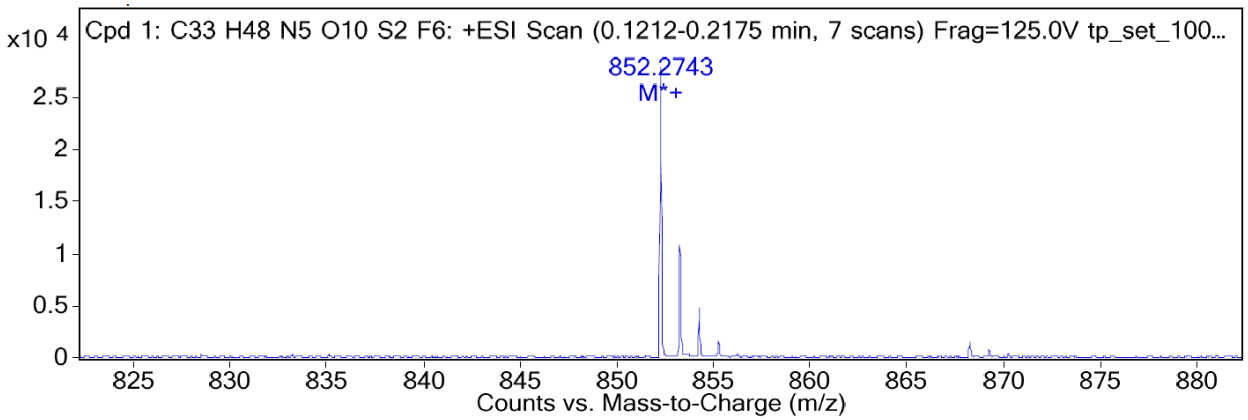
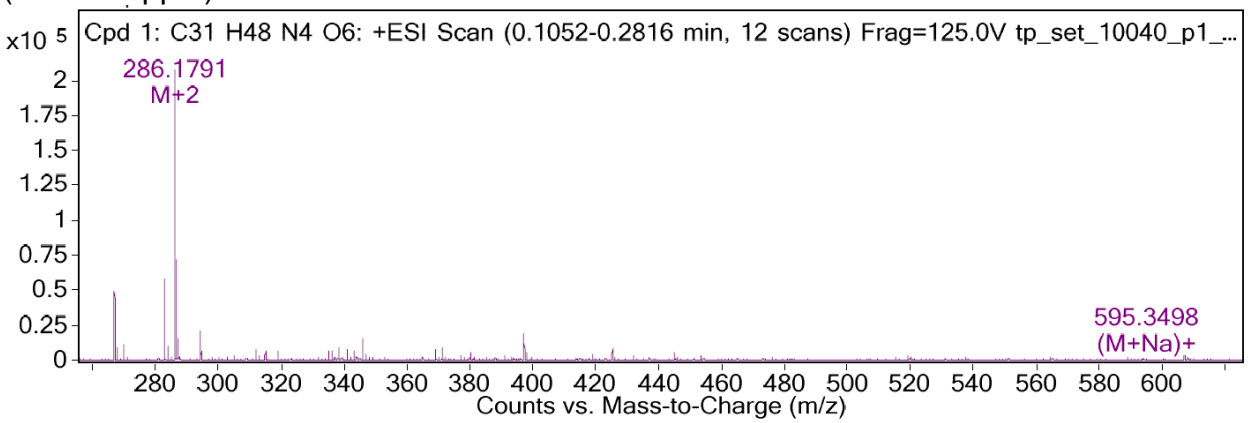


Figure S23b. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OEIm^{+}EO$_4$CH$_3$]$_2$ (TFSI^{-})$_2$ (**8e**).



HR MS: calc. for $C_{35}H_{48}O_{14}N_5S_2F_6$ [M – TFSI]$^+$: m/z 852.2741; found: m/z 852.2743 (error 0.2 ppm).

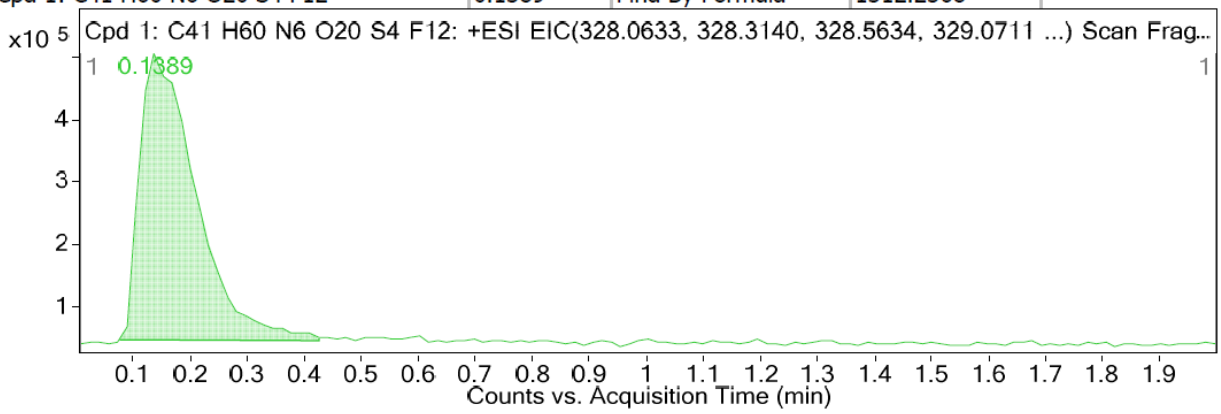


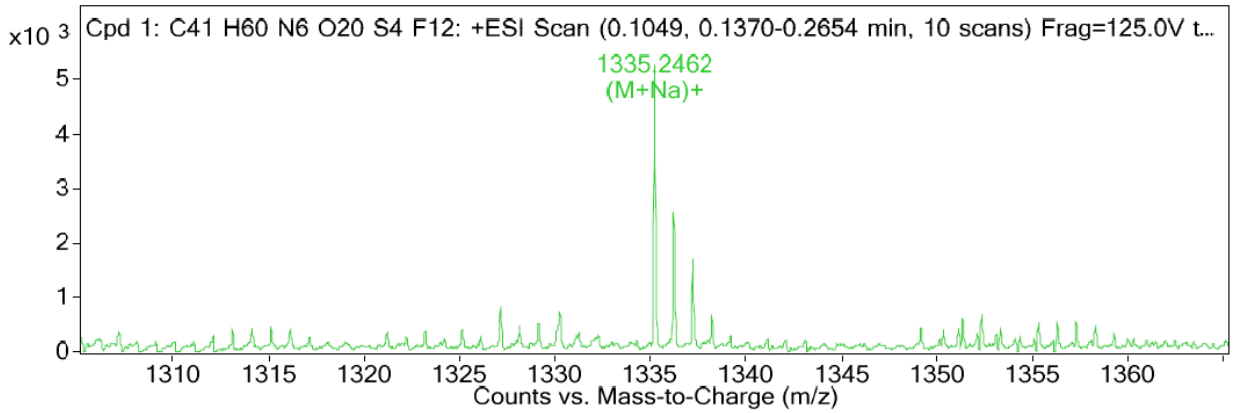
HR MS: calc. for $C_{35}H_{48}O_{14}N_4$ [M – 2TFSI]$^{+2}$: m/z 286.1781; found: m/z 286.1791 (error 3.3 ppm).

Figure S24a. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_2$Im$^+$Bu]$_2$ (TFSI$^-$)$_2$ (**8f**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C41 H60 N6 O20 S4 F12	0.1389	1312.2568	5264	C41 H60 N6 O20 S4 F12	1312.2554	1.07

Compound Label	RT	Algorithm	Mass
Cpd 1: C41 H60 N6 O20 S4 F12	0.1389	Find By Formula	1312.2568





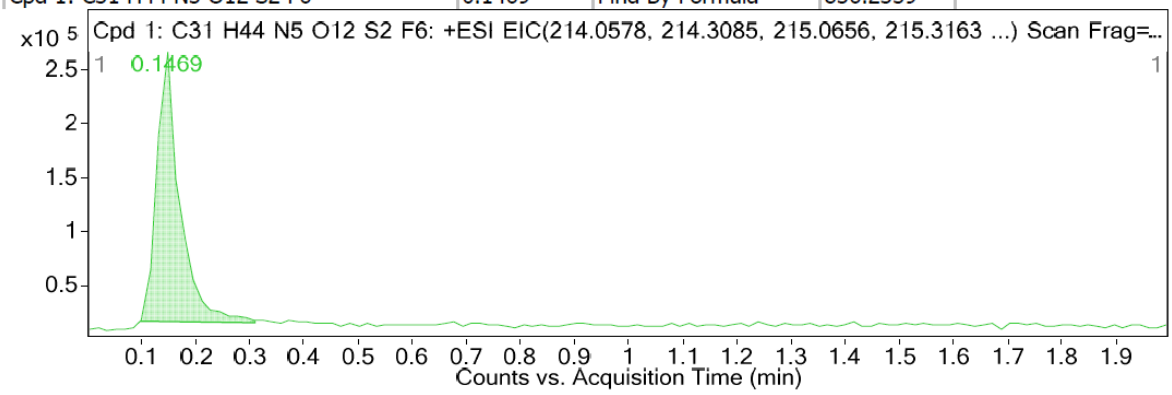
MS Spectrum Peak List

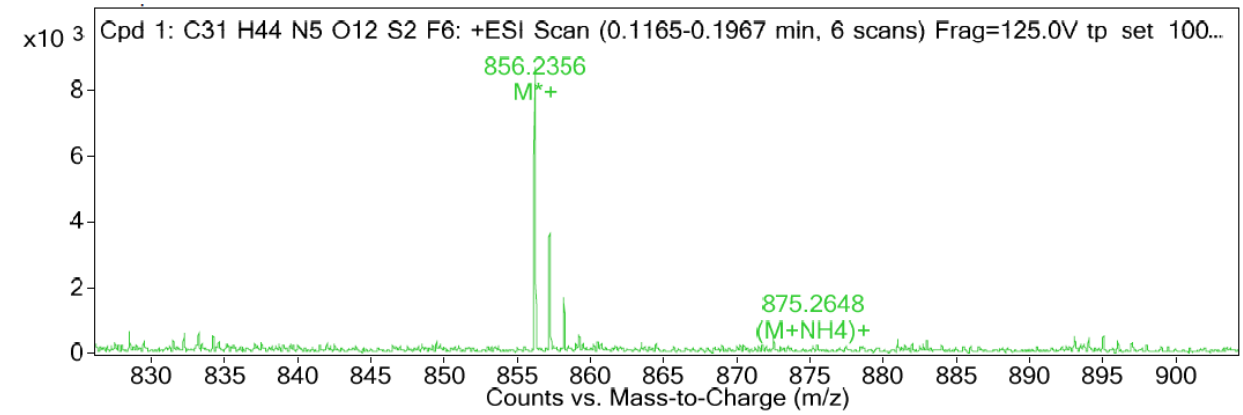
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
360.1807				60590		
361.1871				20254		
365.1372				375314		
365.3028				10957		
366.1401				79869		
367.1432				12056		
367.2591				7760		
369.2105				14375		
369.3842				68511		
1335.2462	1335.2446	1.21	1	5282	C41 H60 F12 N6 Na O20 S4	(M+Na)+

Figure S24b. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_2$Im$^+$Bu]$_2$ (TFSI$^-$)$_2$ (**8f**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C31 H44 N5 O12 S2 F6	0.1469	856.2359	8714	C31 H44 N5 O12 S2 F6	856.2332	3.14

Compound Label	RT	Algorithm	Mass
Cpd 1: C31 H44 N5 O12 S2 F6	0.1469	Find By Formula	856.2359





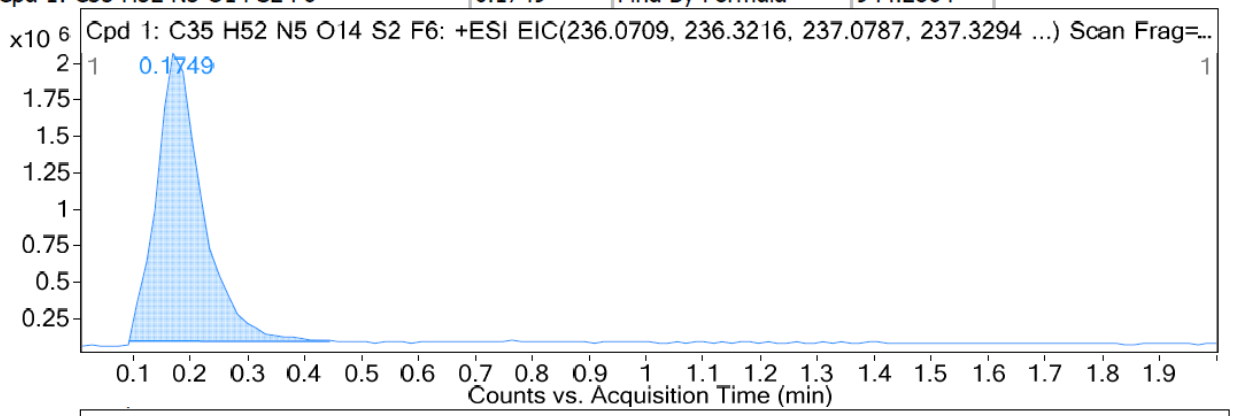
MS Spectrum Peak List

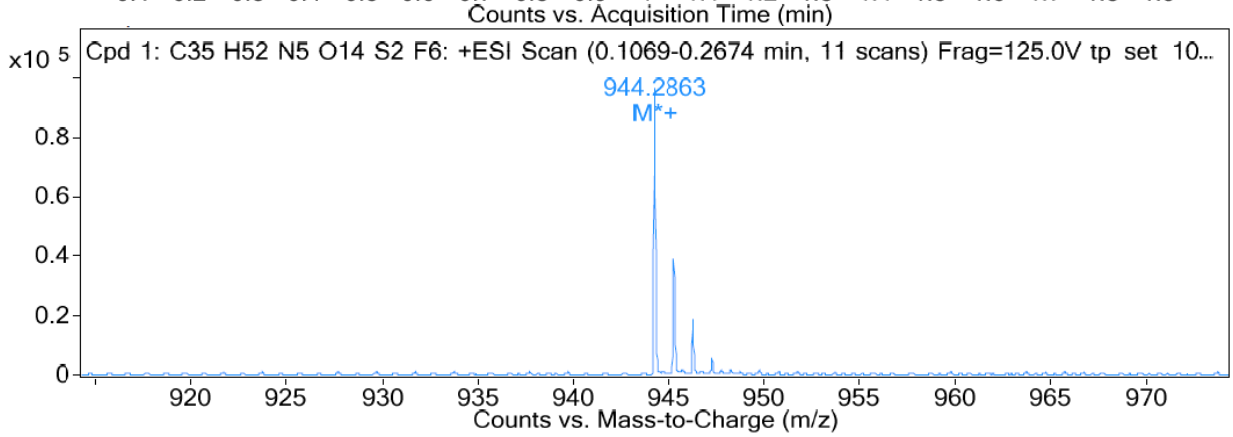
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
284.281				3961		
285.2545				2056		
288.1599				132661		
288.3083				2752		
288.6616				44707		
289.164				9633		
856.2356	856.2327	3.45	1	8799	C31 H44 N5 O12 S2 F6	M*+
857.2392	857.2356	4.26	1	3674	C31 H44 N5 O12 S2 F6	M*+
858.2372	858.2334	4.42	1	1711	C31 H44 N5 O12 S2 F6	M*+
874.2625	874.267	-5.22	1	66	C31 H48 F6 N6 O12 S2	(M+NH4)+

Figure S25. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_2$Im$^+$EOCH$_3$]$_2$ (TFSI$^-$)$_2$ (**8g**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C35 H52 N5 O14 S2 F6	0.1749	944.2864	96338	C35 H52 N5 O14 S2 F6	944.2856	0.84

Compound Label	RT	Algorithm	Mass
Cpd 1: C35 H52 N5 O14 S2 F6	0.1749	Find By Formula	944.2864





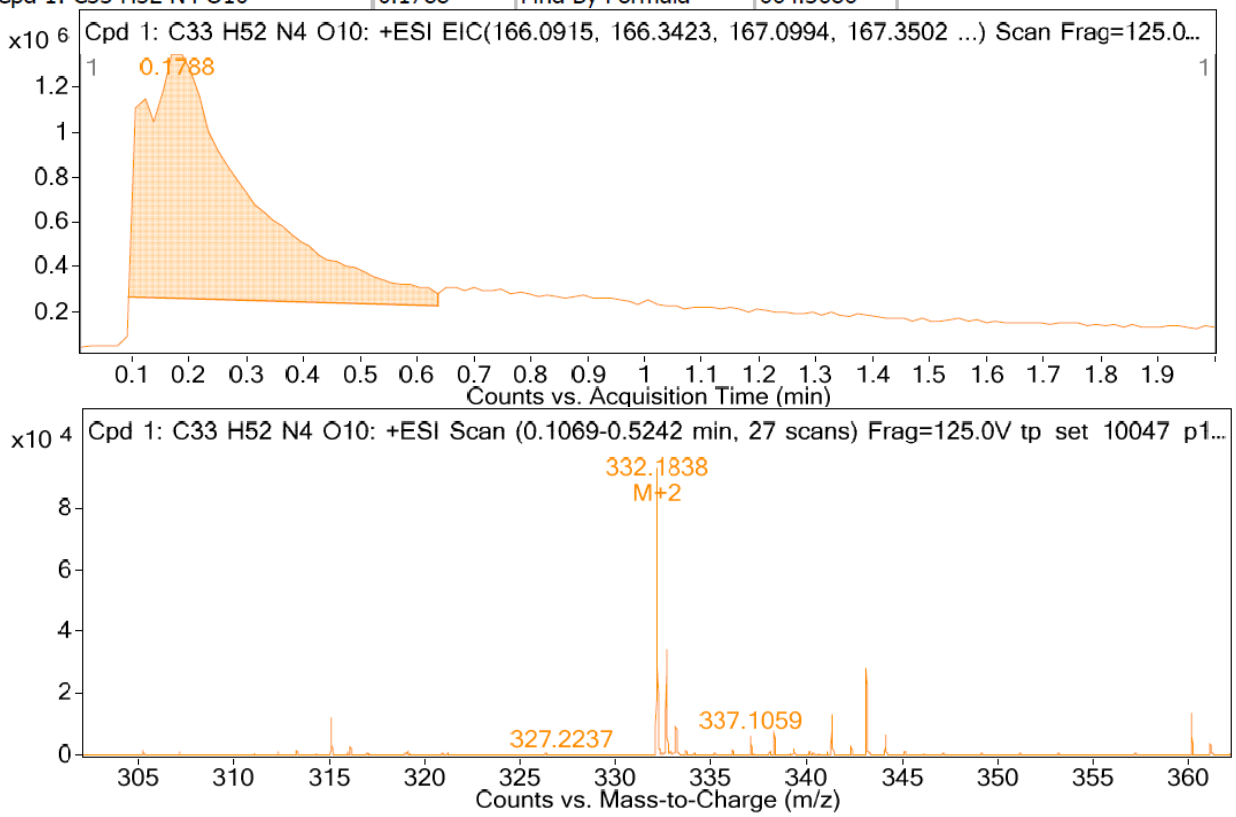
MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
332.1831				124553		
332.3449				2689		
332.6862				44669		
333.1837				12528		
336.1476				3768		
337.106				12674		
944.2863	944.2851	1.27	1	97519	C35 H52 N5 O14 S2 F6	M*+
945.2889	945.2881	0.86	1	39701	C35 H52 N5 O14 S2 F6	M*+
946.2868	946.2864	0.42	1	19082	C35 H52 N5 O14 S2 F6	M*+
947.2874	947.2876	-0.19	1	5852	C35 H52 N5 O14 S2 F6	M*+

Figure S26a. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_2Im^+EO_2CH_3]_2$ $(TFSI^-)_2$ (**8h**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C33 H52 N4 O10	0.1788	664.3686	92869	C33 H52 N4 O10	664.3683	0.35

Compound Label	RT	Algorithm	Mass
Cpd 1: C33 H52 N4 O10	0.1788	Find By Formula	664.3686



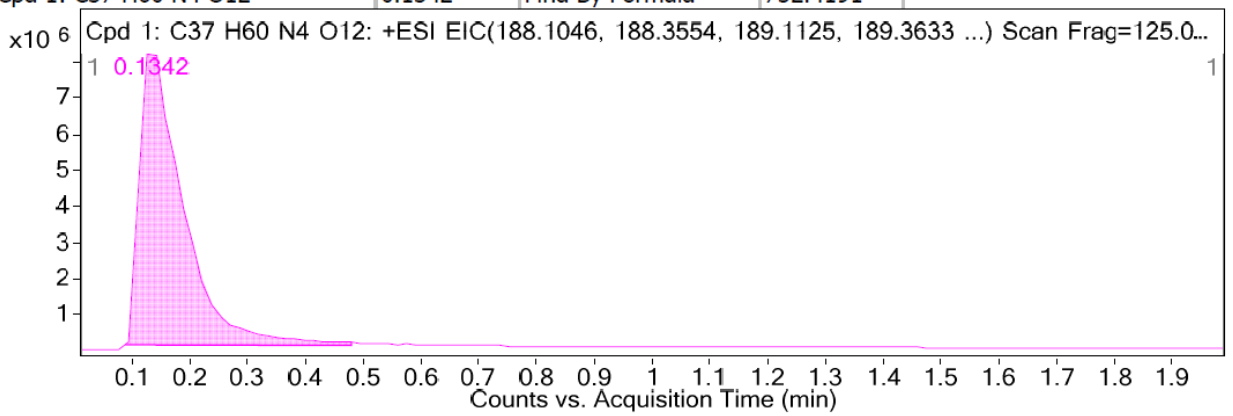
MS Spectrum Peak List

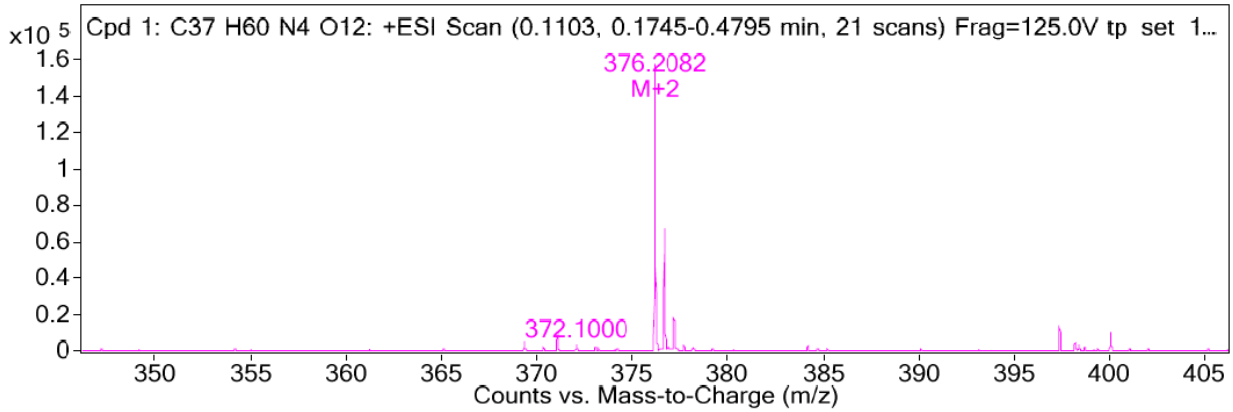
m/z	*Calc m/z*	Diff(ppm)	Abund	Formula	Ion
332.1838	332.1836	0.58	92951	C33 H52 N4 O10	M+2
332.346			1807		
332.6863	332.6852	3.26	34462	C33 H52 N4 O10	M+2
332.8481			843		
333.1858	333.1866	-2.25	9127	C33 H52 N4 O10	M+2
333.6897	333.6879	5.56	1638	C33 H52 N4 O10	M+2
334.176	334.1891	-39.3	414	C33 H52 N4 O10	M+2
335.2181			548		
336.1473			1680		
337.1059			5806		

Figure S26b. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_2Im^+EO_2CH_3]_2$ $(TFSI^-)_2$ (**8h**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C37 H60 N4 O12	0.1342	752.4191	157328	C37 H60 N4 O12	752.4208	-2.21

Compound Label	RT	Algorithm	Mass
Cpd 1: C37 H60 N4 O12	0.1342	Find By Formula	752.4191





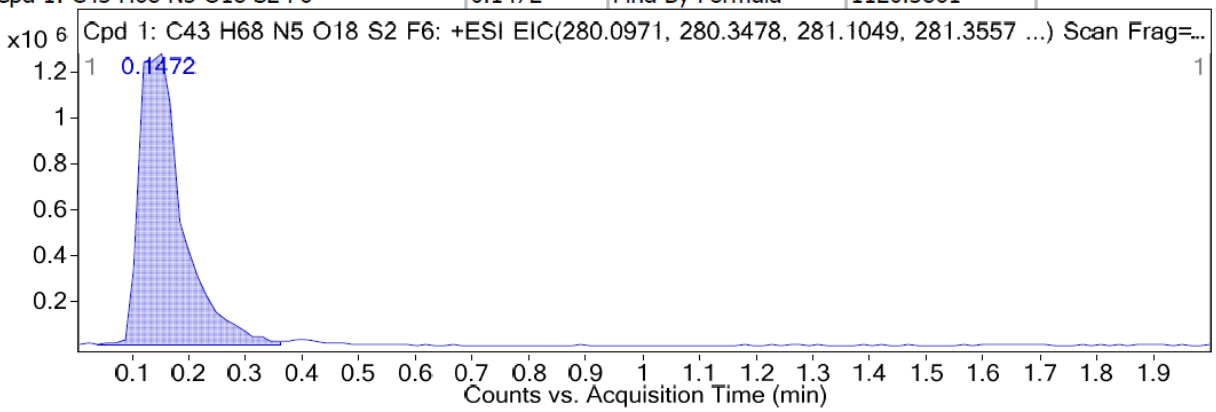
MS Spectrum Peak List

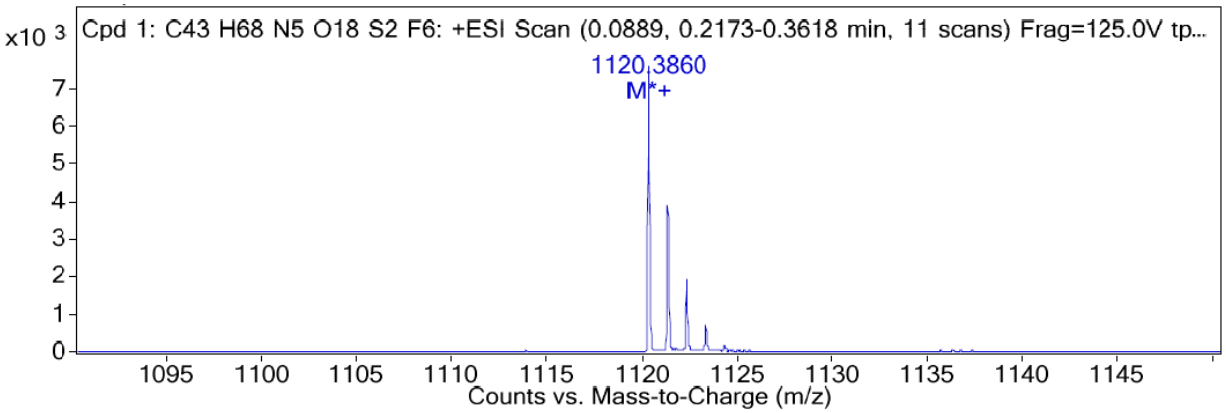
m/z	*Calc m/z*	Diff(ppm)	Abund	Formula	Ion
372.1			3494		
373.0977			2128		
373.2296			1643		
376.2082	376.2098	-4.4	157492	C37 H60 N4 O12	M+2
376.3791			3732		
376.7097	376.7114	-4.7	67104	C37 H60 N4 O12	M+2
376.8815			1579		
377.211	377.2128	-4.67	17672	C37 H60 N4 O12	M+2
377.7119	377.7141	-6	3795	C37 H60 N4 O12	M+2
378.2163			1818		

Figure S27. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_2$Im$^+$EO$_3$CH$_3$]$_2$ (TFSI$^-$)$_2$ (**8i**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C43 H68 N5 O18 S2 F6	0.1472	1120.3861	7587	C43 H68 N5 O18 S2 F6	1120.3905	-3.92

Compound Label	RT	Algorithm	Mass
Cpd 1: C43 H68 N5 O18 S2 F6	0.1472	Find By Formula	1120.3861

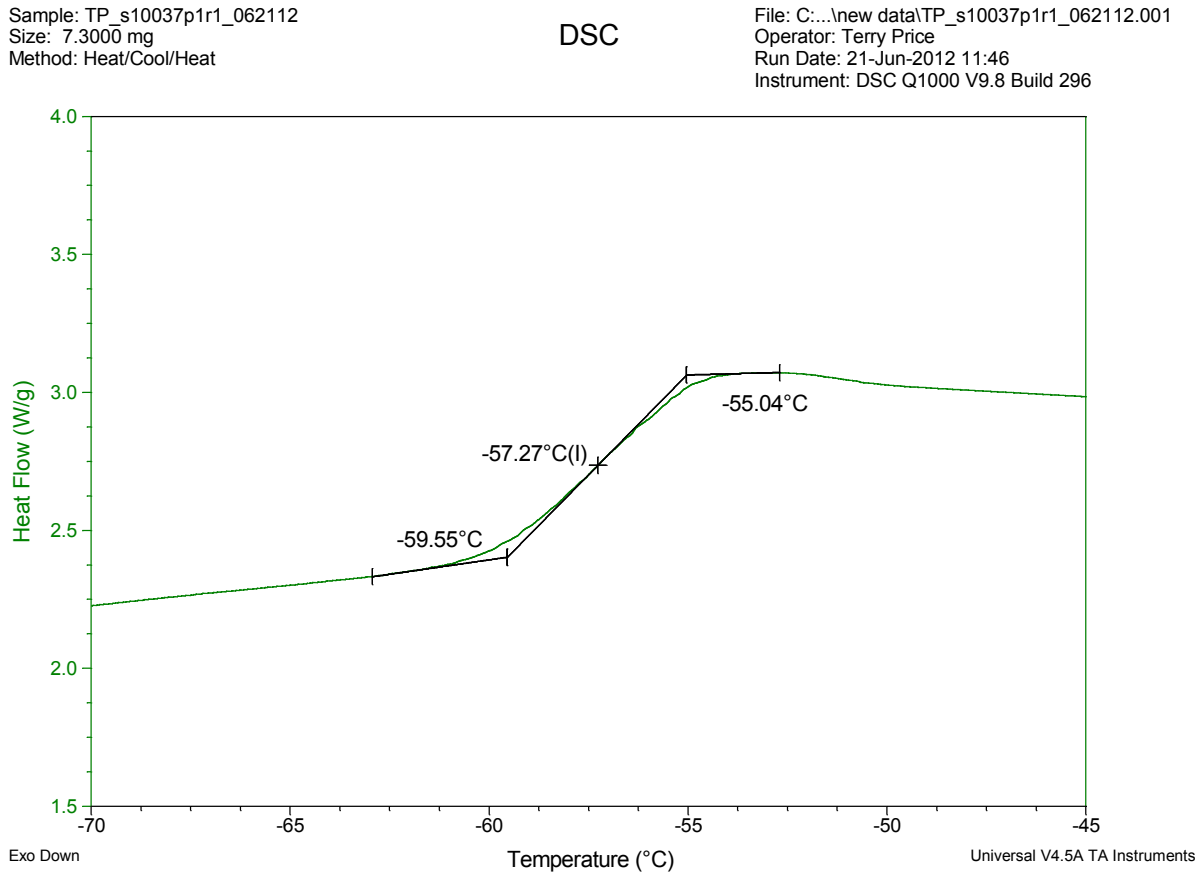




MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
420.2351				460029		
420.4116				12756		
420.4859				3020		
420.7365				221241		
420.9151				6711		
421.2375				65551		
421.7387				14540		
422.24				2998		
1120.386	1120.3899	-3.52	1	7635	C43 H68 N5 O18 S2 F6	M*+
1121.3898	1121.393	-2.89	1	3896	C43 H68 N5 O18 S2 F6	M*+

Figure S28. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_2$Im$^+$EO$_4$CH$_3$]$_2$ (TFSI$^-$)$_2$ (**8j**).



Heat / Cool / Heat cycle at 10°C / min

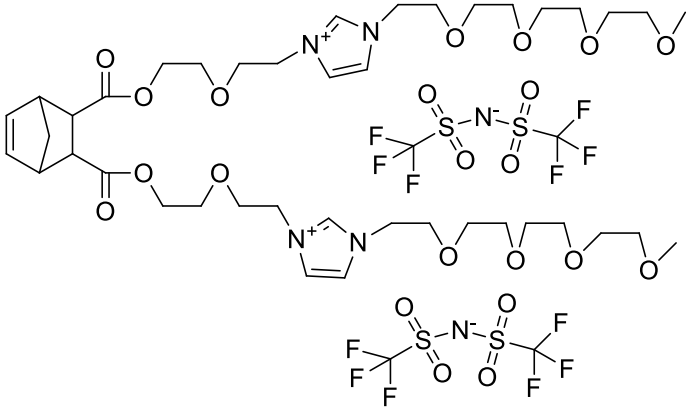
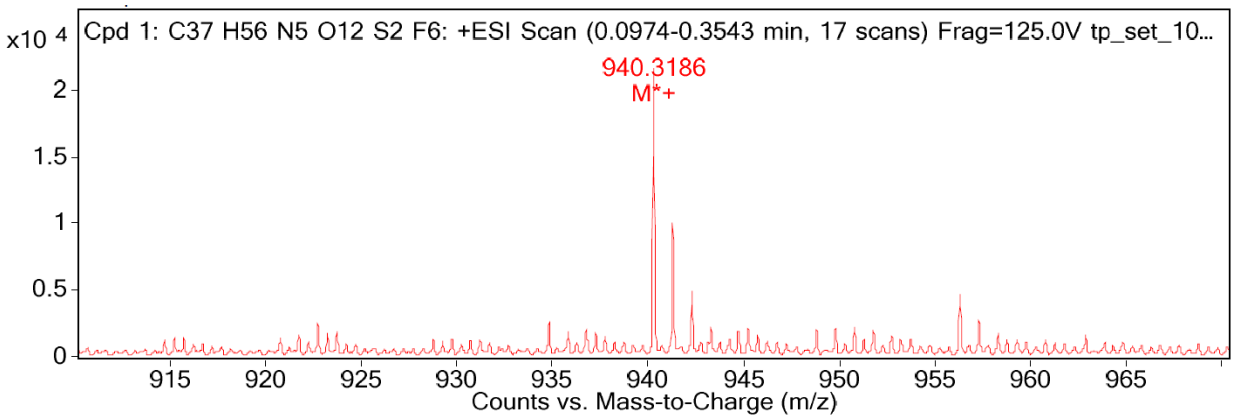


Figure S29. DSC trace (second heating) of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_2Im^+EO_4CH_3]_2$ $(TFSI^-)_2$ (**8j**).

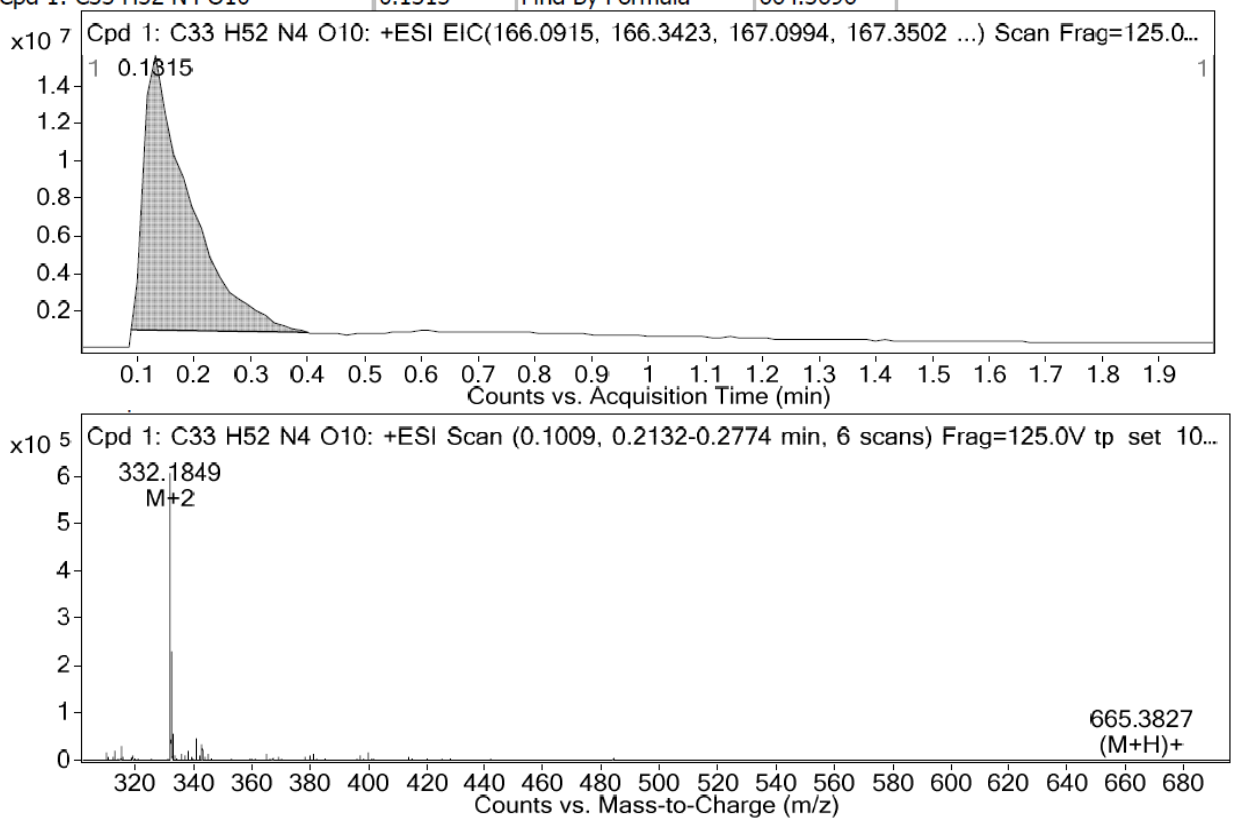


HR MS: calc. for $C_{39}H_{56}O_{16}N_5S_2F_6$ [M – TFSI]$^+$: m/z 940.3266; found: m/z 940.3186 (error -8.5 ppm).

Figure S30. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_3$Im$^+$Bu]$_2$ (TFSI$^-$)$_2$ (**8k**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C33 H52 N4 O10	0.1315	664.3696	604605	C33 H52 N4 O10	664.3683	1.84

Compound Label	RT	Algorithm	Mass
Cpd 1: C33 H52 N4 O10	0.1315	Find By Formula	664.3696



MS Spectrum Peak List

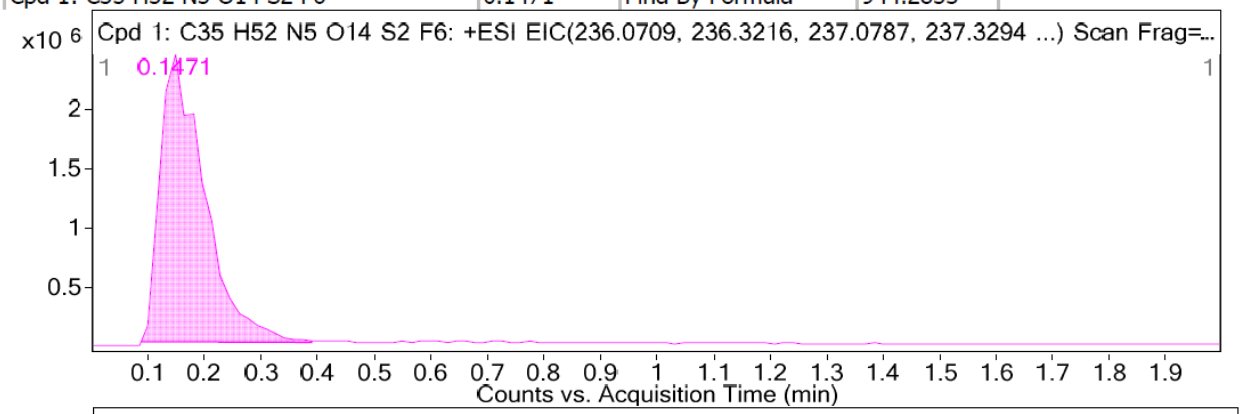
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
332.1849	332.1836	3.71		611594	C33 H52 N4 O10	M+2
332.3431				20029		
332.4104				4836		
332.6863	332.6852	3.28		232423	C33 H52 N4 O10	M+2
332.8451				7526		
333.1872	333.1866	1.86		56559	C33 H52 N4 O10	M+2
333.6886	333.6879	2.07		10477	C33 H52 N4 O10	M+2
336.1448				12610		
337.1095				11007		
665.3827	665.3756	10.61	1	51	C33 H53 N4 O10	(M+H)+

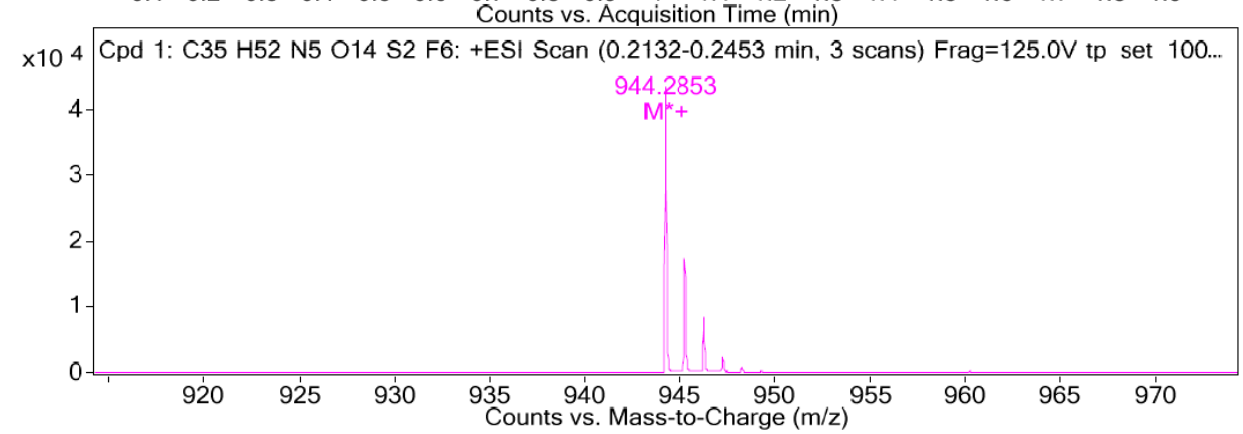
High res MS +2 peak: calc. for $C_{33}H_{52}O_{10}N_4$ [M]+: m/z 664.3683; found: m/z 664.3696 (error 1.8 ppm)

Figure S31a. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_3$Im$^+$EOCH$_3$]$_2$ (TFSI$^-$)$_2$ (**8l**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C35 H52 N5 O14 S2 F6	0.1471	944.2853	43366	C35 H52 N5 O14 S2 F6	944.2856	-0.32

Compound Label	RT	Algorithm	Mass
Cpd 1: C35 H52 N5 O14 S2 F6	0.1471	Find By Formula	944.2853





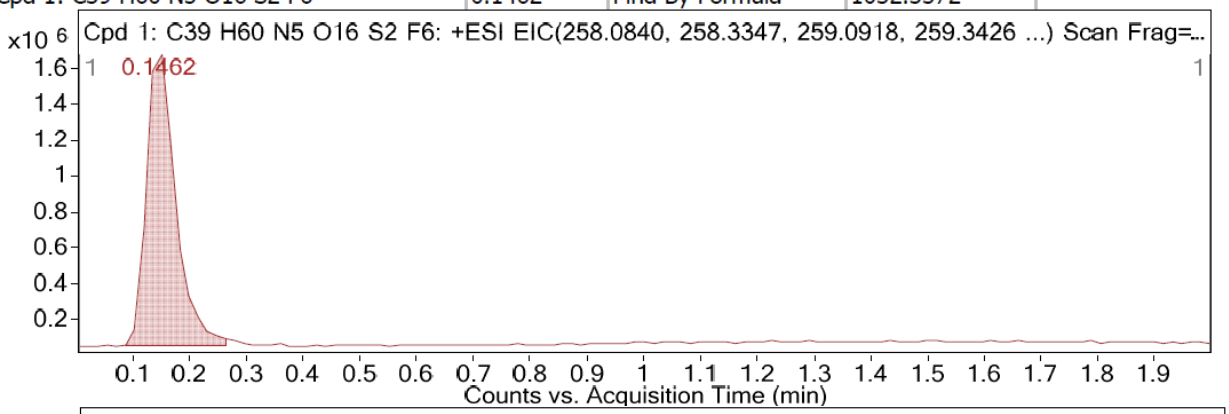
MS Spectrum Peak List

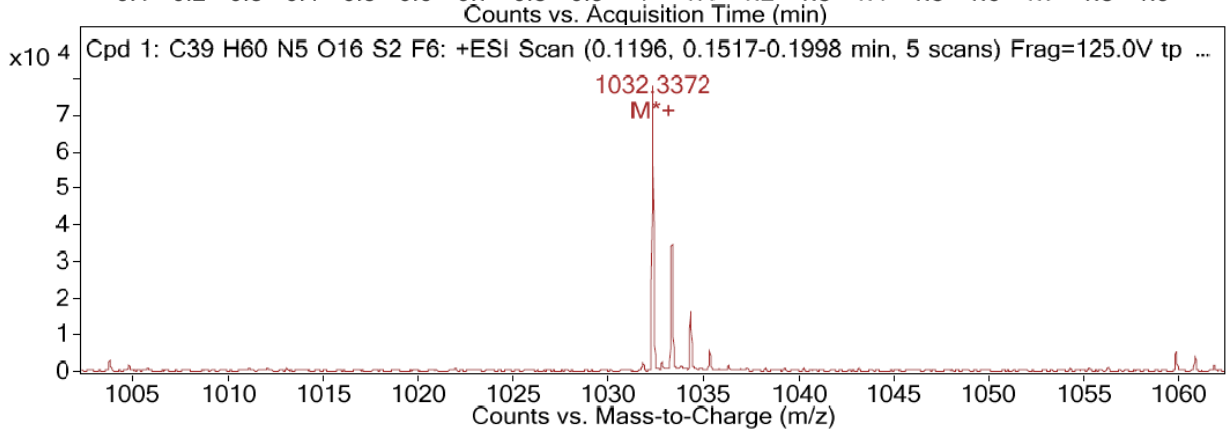
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
332.1849				720715		
332.3428				26076		
332.6864				271333		
332.8452				9373		
333.1871				67034		
333.6888				12078		
336.1449				16596		
337.1107				14180		
944.2853	944.2851	0.25	1	43502	C35 H52 N5 O14 S2 F6	M*+
945.2866	945.2881	-1.54	1	17449	C35 H52 N5 O14 S2 F6	M*+

High res MS +1 peak: calc. for $C_{35}H_{52}O_{14}N_5S_2F_6$ [M]+: m/z 944.2856; found: m/z 944.2853 (error -0.3 ppm)

Figure S31b. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_3$Im$^+$EOCH$_3$]$_2$ (TFSI$^-$)$_2$ (**8l**).

Compound Label	RT	Algorithm	Mass
Cpd 1: C39 H60 N5 O16 S2 F6	0.1462	Find By Formula	1032.3372





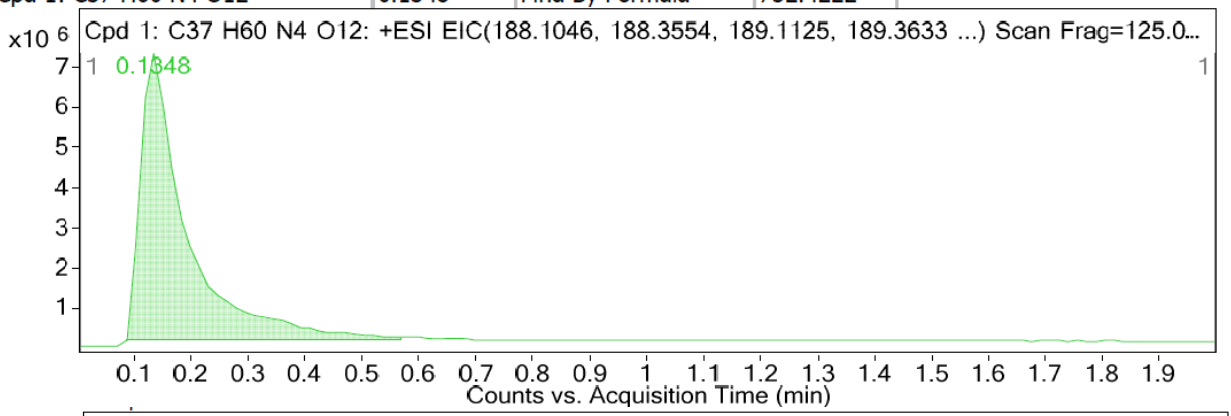
MS Spectrum Peak List

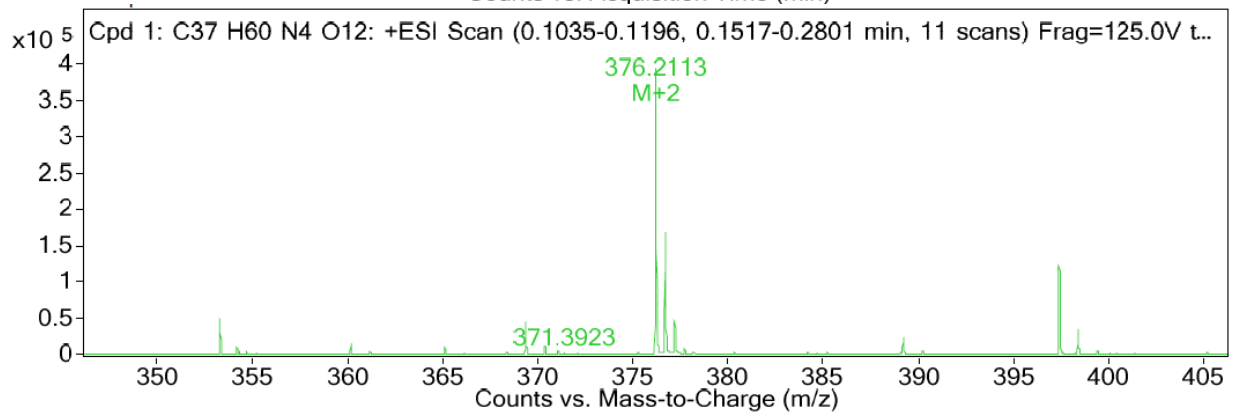
m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
376.2112				596294		
376.3789				19929		
376.7126				259542		
376.8803				8898		
377.2135				68438		
377.7156				13870		
1032.3372	1032.3375	-0.32	1	78009	C39 H60 N5 O16 S2 F6	M*+
1033.3396	1033.3405	-0.96	1	35236	C39 H60 N5 O16 S2 F6	M*+
1034.3383	1034.3393	-0.96	1	16603	C39 H60 N5 O16 S2 F6	M*+
1035.3394	1035.3404	-0.96	1	5648	C39 H60 N5 O16 S2 F6	M*+

Figure S32a. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_3Im^+EO_2CH_3]_2$ $(TFSI^-)_2$ (**8m**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C37 H60 N4 O12	0.1348	752.4222	393582	C37 H60 N4 O12	752.4208	1.89

Compound Label	RT	Algorithm	Mass
Cpd 1: C37 H60 N4 O12	0.1348	Find By Formula	752.4222

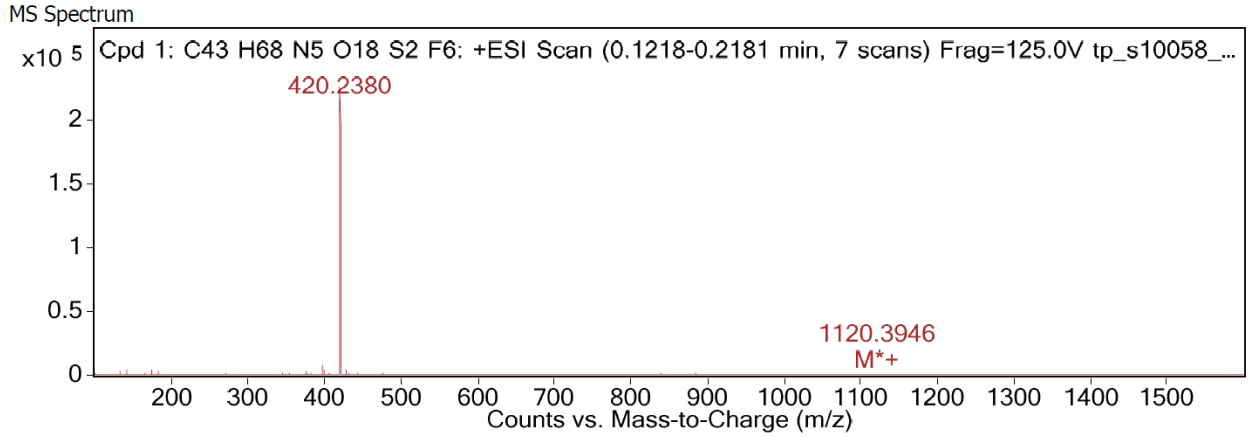


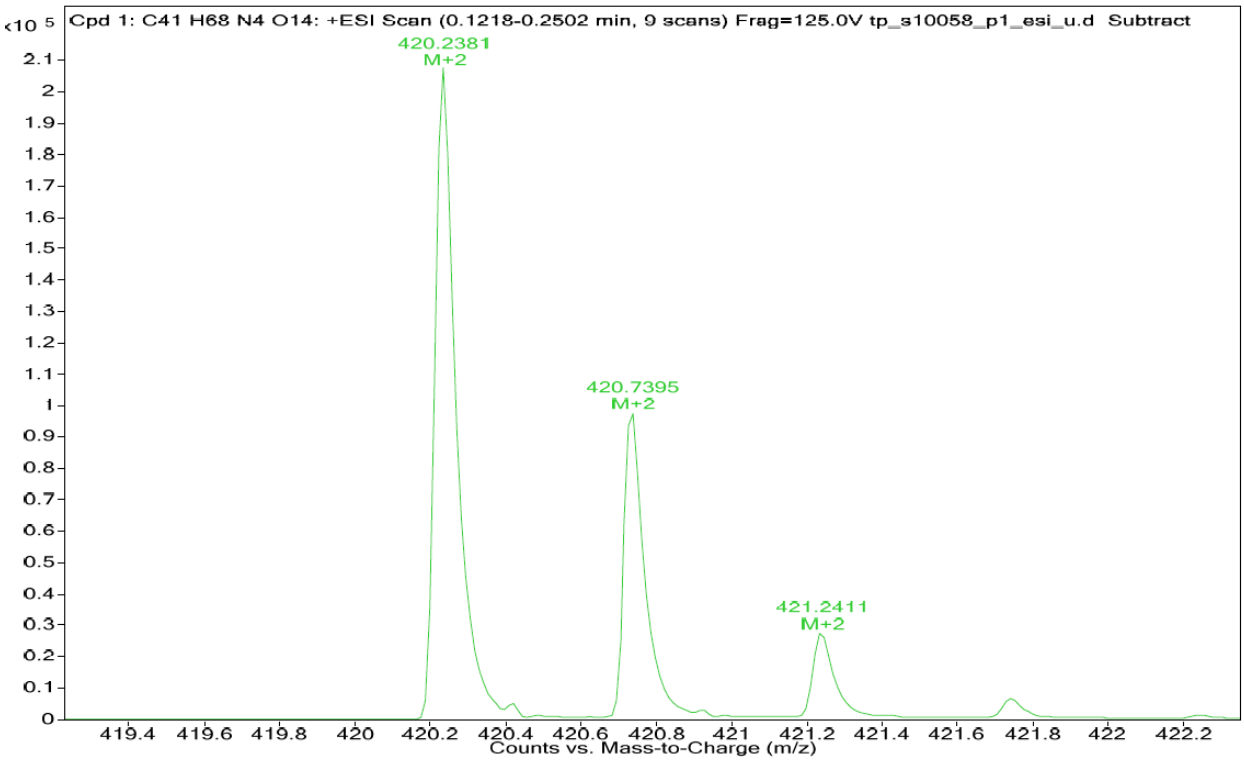


MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	Abund	Formula	Ion
375.2981			2654		
376.2113	376.2098	3.85	399225	C37 H60 N4 O12	M+2
376.3791			11632		
376.4508			2664		
376.7126	376.7114	3.06	173624	C37 H60 N4 O12	M+2
376.8809			5227		
377.2138	377.2128	2.73	45906	C37 H60 N4 O12	M+2
377.7156	377.7141	3.87	9287	C37 H60 N4 O12	M+2
378.2147	378.2154	-1.93	2806	C37 H60 N4 O12	M+2
380.3318			2499		

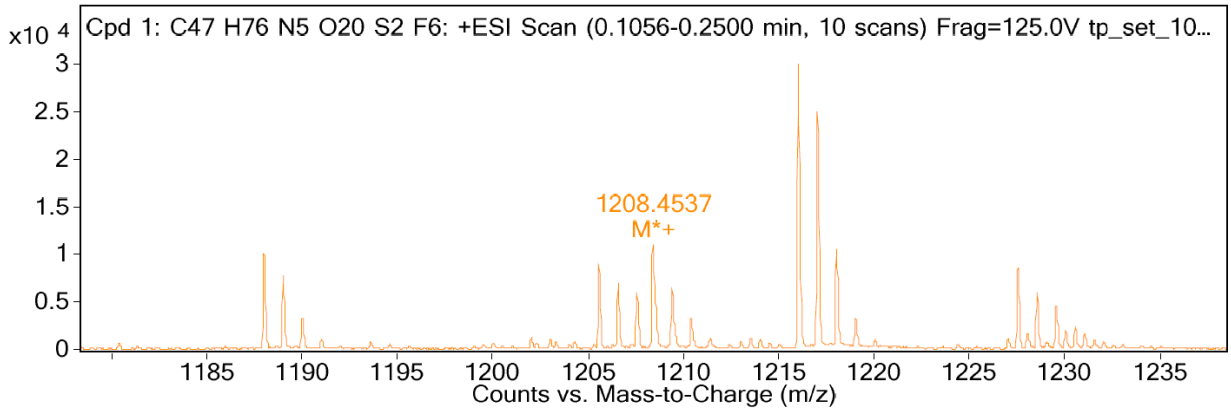
Figure S32b. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_3Im^+EO_2CH_3]_2(TFSI^-)_2$ (**8m**).



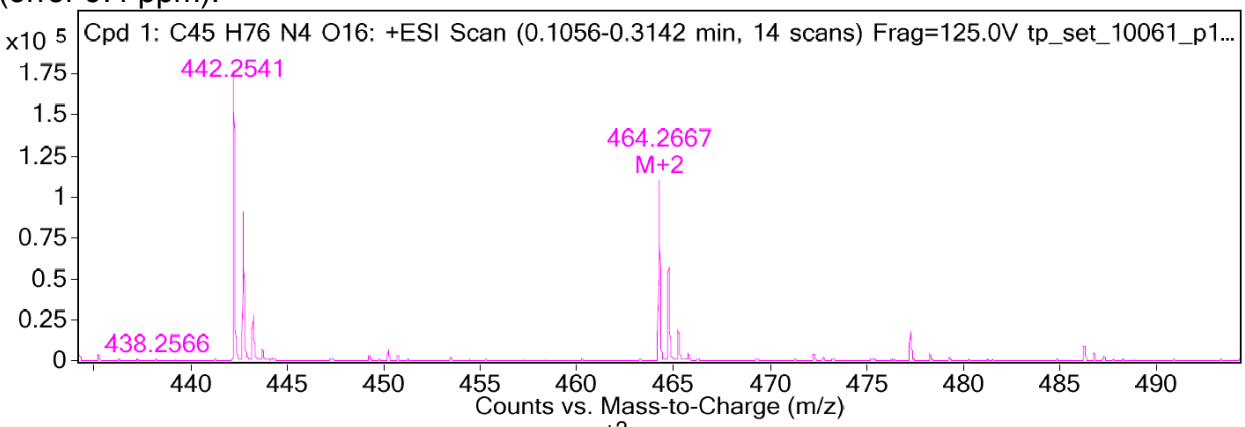


HR MS: calc. for $C_{45}H_{68}O_{22}N_6S_4F_{12}$ $[M - TFSI]^+$: m/z 1120.3899; found: m/z 1120.3946 (error 4.1 ppm). HR MS: calc. for $C_{45}H_{68}O_{22}N_6S_4F_{12}$ $[M - 2TFSI]^{+2}$: m/z 420.2361; found: m/z 420.2381 (error 4.8 ppm)

Figure S33. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_3Im^+EO_3CH_3]_2(TFSI^-)_2$ **(8n).**

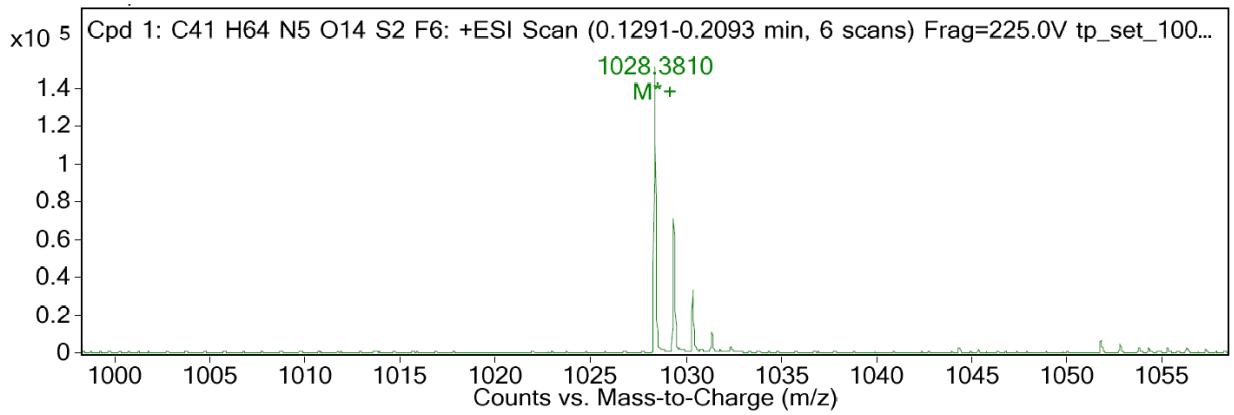


HR MS: calc. for $C_{49}H_{76}O_{24}N_5S_2F_6$ $[M - TFSI]^+$: m/z 1208.4424; found: m/z 1208.4537 (error 9.4 ppm).

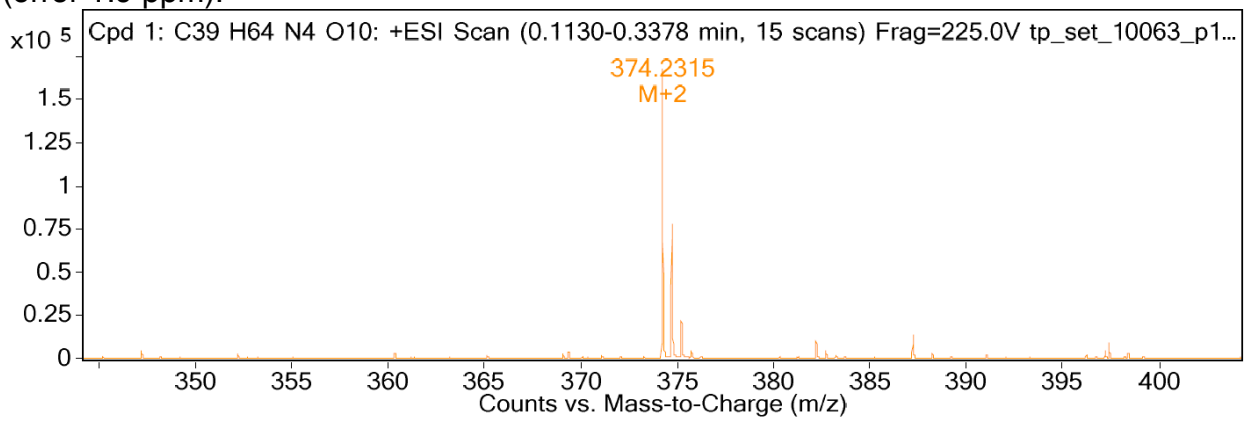


HR MS: calc. for $C_{49}H_{76}O_{24}N_4$ $[M - 2TFSI]^{+2}$: m/z 464.2623; found: m/z 464.2667 (error 9.6 ppm)

Figure S34. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_3Im^+EO_4CH_3]_2(TFSI^-)_2$ (**8o**).



HR MS: calc. for $C_{43}H_{64}O_{18}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1028.3790; found: m/z 1028.3810 (error 1.9 ppm).

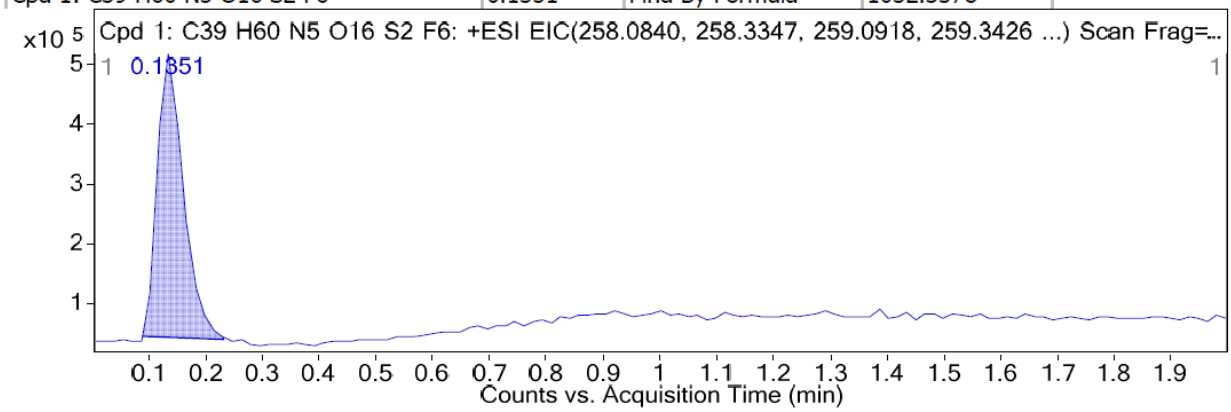


HR MS: calc. for $C_{43}H_{64}O_{18}N_4$ [M – 2TFSI]$^{+2}$: m/z 374.2306; found: m/z 374.2315 (error 2 ppm).

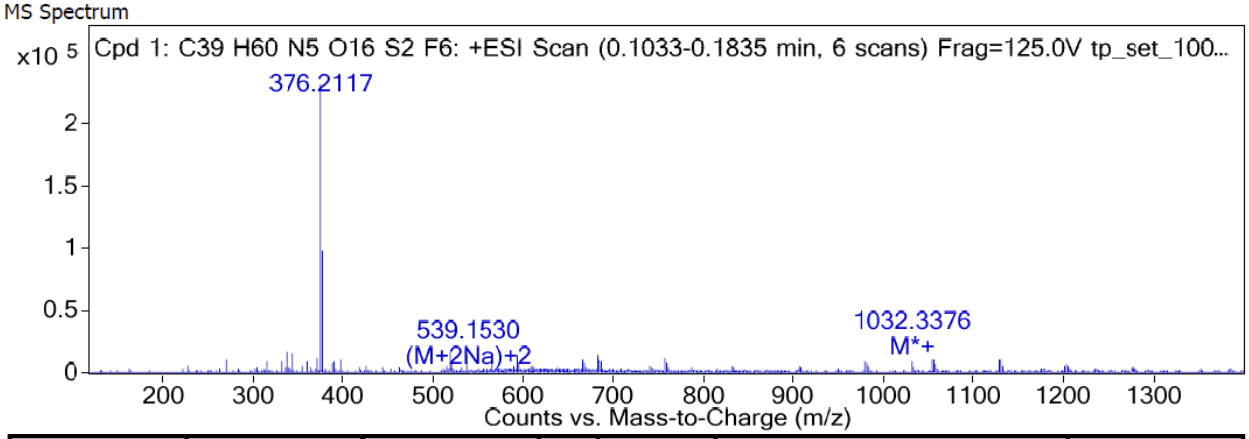
Figure S35. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_4$Im$^+$Bu]$_2$ (TFSI$^-$)$_2$ (**8p**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C39 H60 N5 O16 S2 F6	0.1351	1032.3378	8321	C39 H60 N5 O16 S2 F6	1032.3381	-0.3

Compound Label	RT	Algorithm	Mass
Cpd 1: C39 H60 N5 O16 S2 F6	0.1351	Find By Formula	1032.3378



MS Spectrum

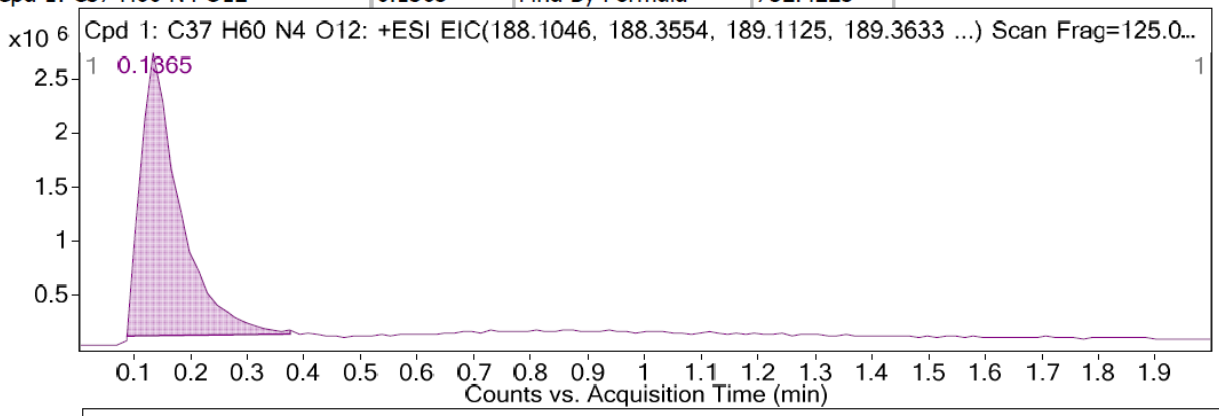


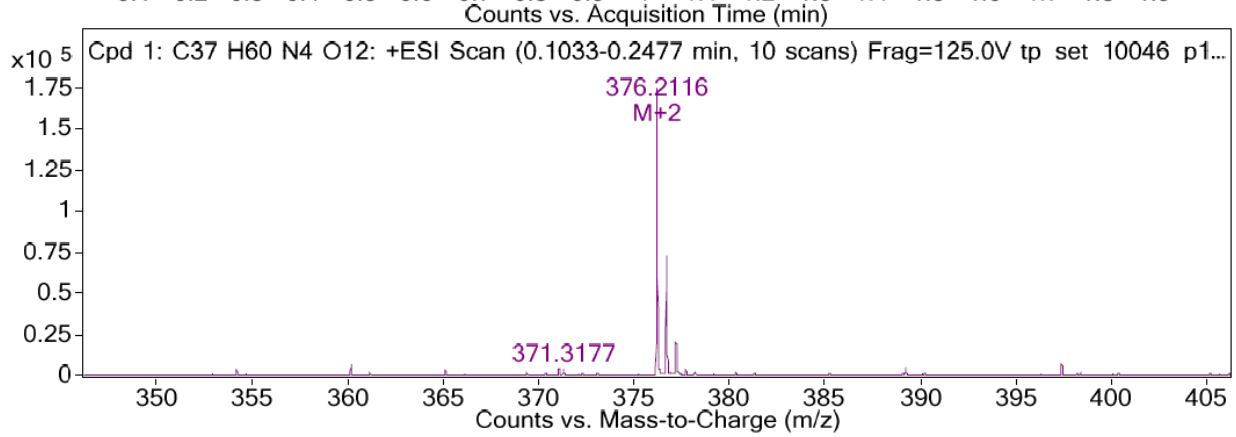
539.153	539.1583	-9.75	2	1572	C39 H60 F6 N5 Na2 O16 S2	(M+2Na)+2
1032.3376	1032.3375	0.08	1	8329	C39 H60 N5 O16 S2 F6	M*+
1033.3416	1033.3405	1.02	1	3986	C39 H60 N5 O16 S2 F6	M*+
1071.2971	1071.3012	-3.83	1	298	C39 H60 F6 K N5 O16 S2	(M+K)+

Figure S36a. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_4$Im$^+$EOCH$_3$]$_2$ (TFSI$^-$)$_2$ (**8q**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C37 H60 N4 O12	0.1365	752.4225	174396	C37 H60 N4 O12	752.4208	2.34

Compound Label	RT	Algorithm	Mass
Cpd 1: C37 H60 N4 O12	0.1365	Find By Formula	752.4225

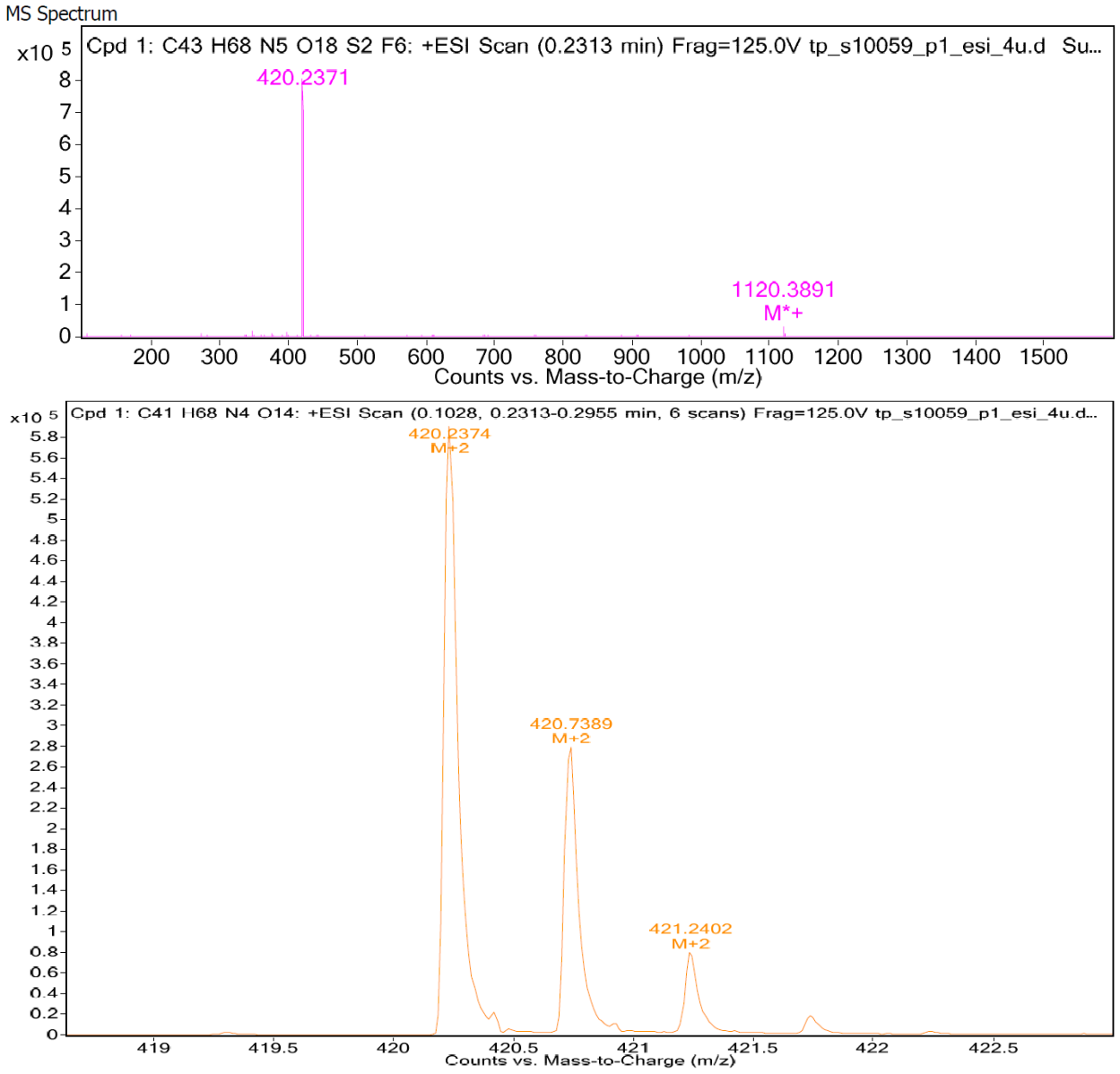




MS Spectrum Peak List

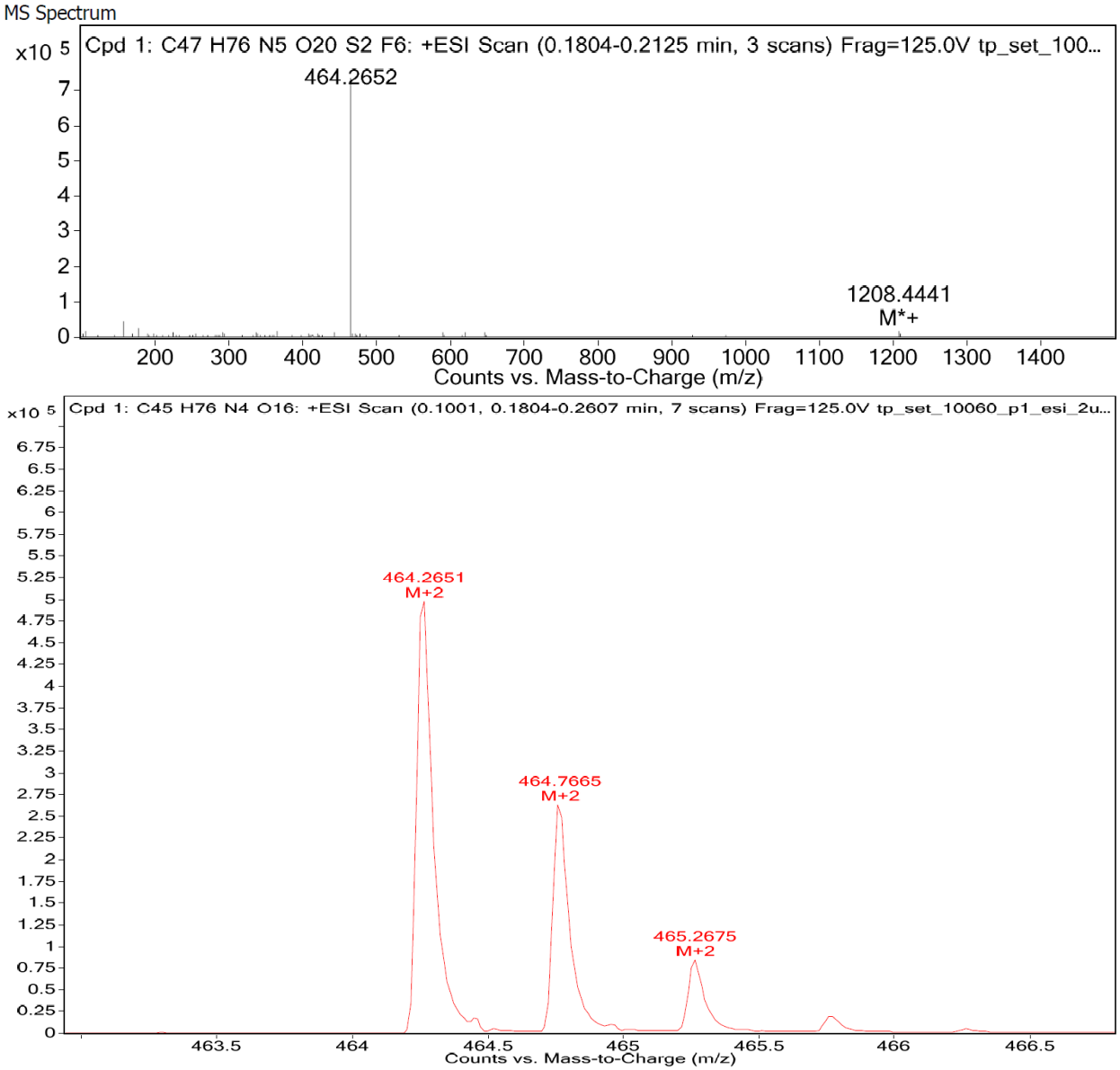
m/z	*Calc m/z*	Diff(ppm)	Abund	Formula	Ion
371.3177			3832		
372.1033			1355		
376.2116	376.2098	4.71	175451	C37 H60 N4 O12	M+2
376.3819			3681		
376.7131	376.7114	4.54	74314	C37 H60 N4 O12	M+2
376.8822			1689		
377.2145	377.2128	4.46	20157	C37 H60 N4 O12	M+2
377.716	377.7141	4.92	4124	C37 H60 N4 O12	M+2
378.2088			1646		
380.3313			2073		

Figure S36b. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_4$Im$^+$EOCH$_3$]$_2$ (TFSI$^-$)$_2$ (**8q**).



HR MS: calc. for $C_{45}H_{68}O_{22}N_5S_2F_6$ [M – TFSI]$^+$: m/z 1120.3899; found: m/z 1120.3891 (error -0.8 ppm). HR MS: calc. for $C_{45}H_{68}O_{22}N_4$ [M – 2TFSI]$^{+2}$: m/z 420.2361; found: m/z 420.2374 (error 3.2 ppm)

Figure S37. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)OE$_4$Im$^+$EO$_2$CH$_3$]$_2$ (TFSI$^-$)$_2$ (**8r**).

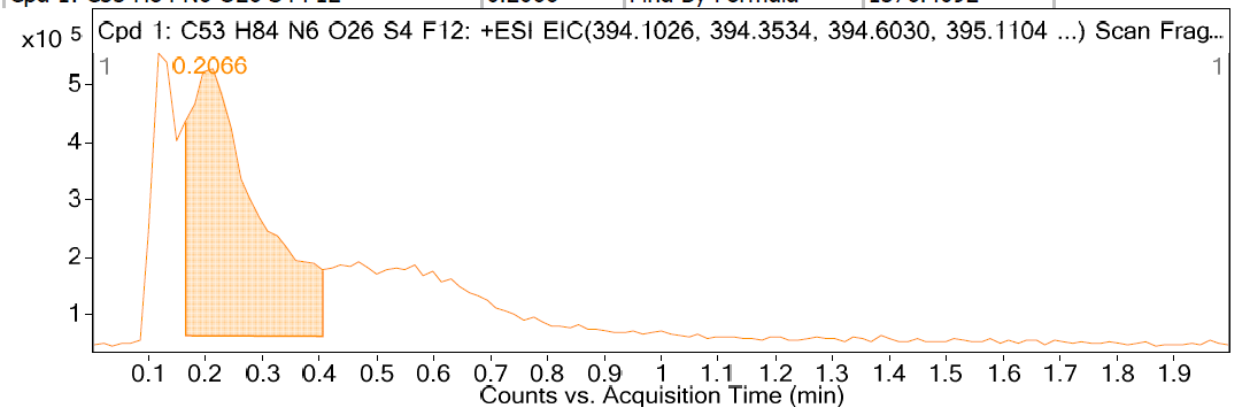


HR MS: calc. for $C_{49}H_{76}O_{24}N_5S_2F_6$ $[M - TFSI]^+$: m/z 1208.4424; found: m/z 1208.4441 (error 1.4 ppm). HR MS: calc. for $C_{49}H_{76}O_{24}N_4$ $[M - 2TFSI]^{+2}$: m/z 464.2623; found: m/z 464.2651 (error 6.0 ppm).

Figure S38. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_4Im^+EO_3CH_3]_2(TFSI^-)_2$ **(8s)**.

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C53 H84 N6 O26 S4 F12	0.2066	1576.4092	528	C53 H84 N6 O26 S4 F12	1576.4126	-2.19

Compound Label	RT	Algorithm	Mass
Cpd 1: C53 H84 N6 O26 S4 F12	0.2066	Find By Formula	1576.4092



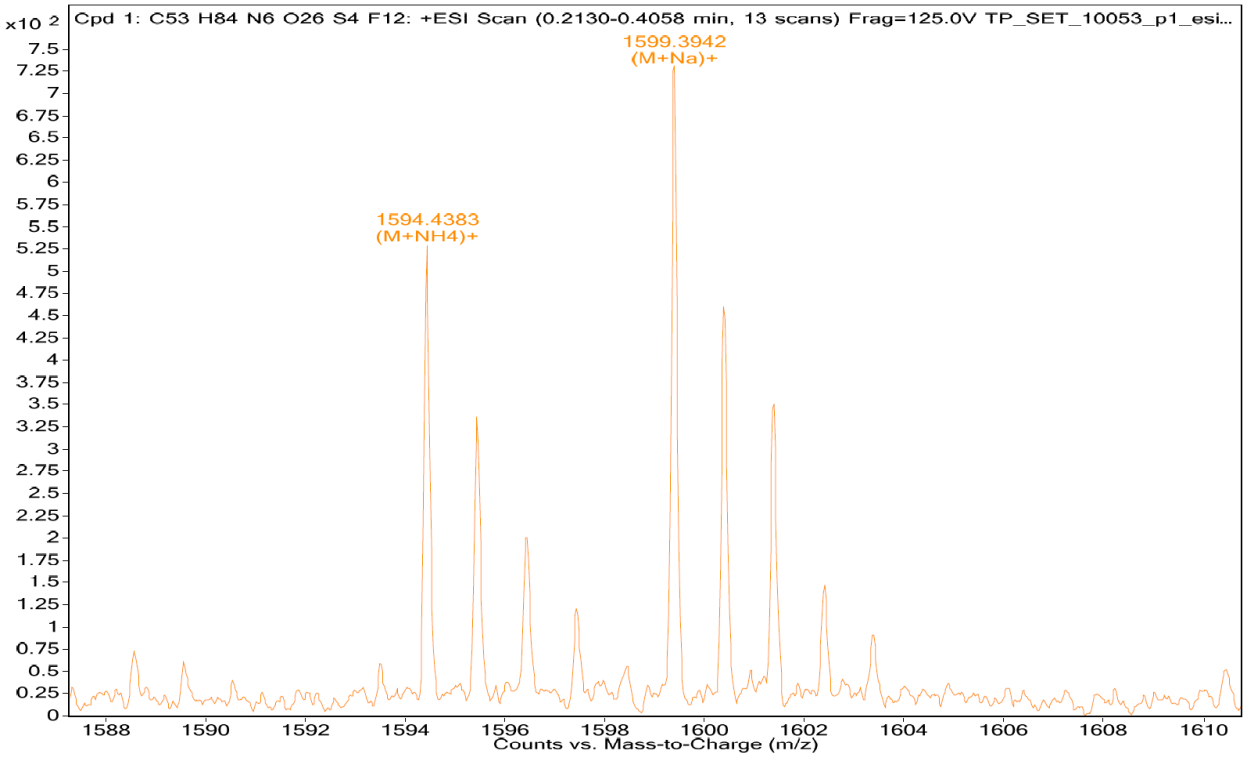


Figure S39a. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_4Im^+EO_4CH_3]_2$ $(TFSI^-)_2$ (**8t**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C49 H84 N4 O18	0.1272	1016.5764	266526	C49 H84 N4 O18	1016.5781	-1.63

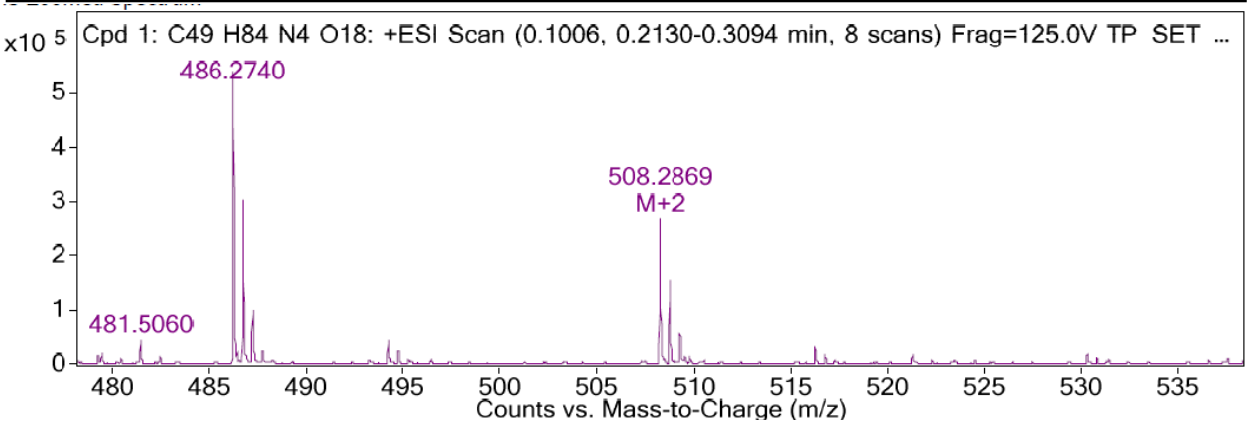


Figure S39b. HR MS of norbornene di(imidazolium) bis(TFSI) NB[$OE_4ImEO_4CH_3^+$]$_2$ ($TFSI^-$)$_2$ (**8t**).

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C51 H84 N5 O22 S2 F6	0.1425	1296.4883	20305	C51 H84 N5 O22 S2 F6	1296.4954	-5.47

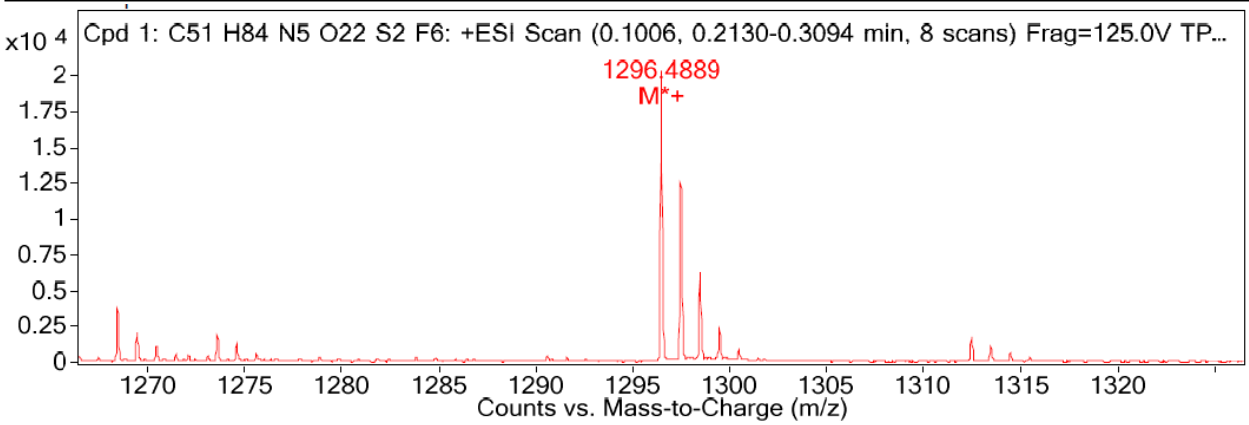
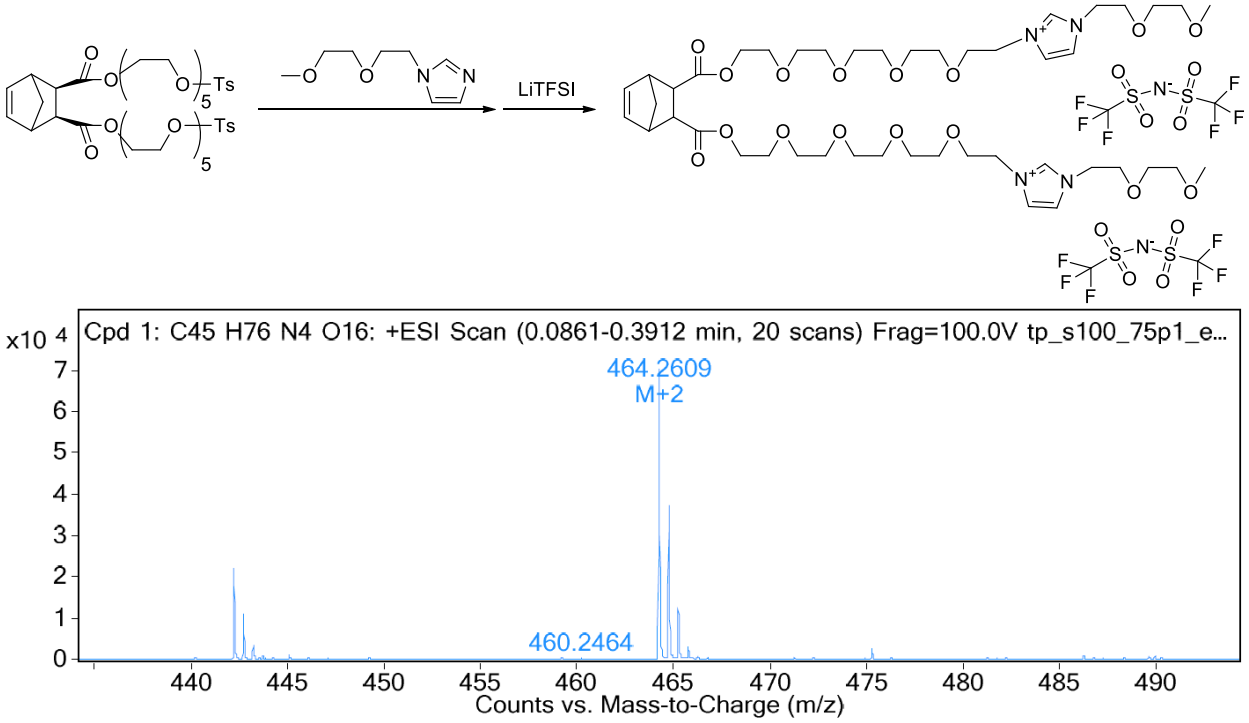
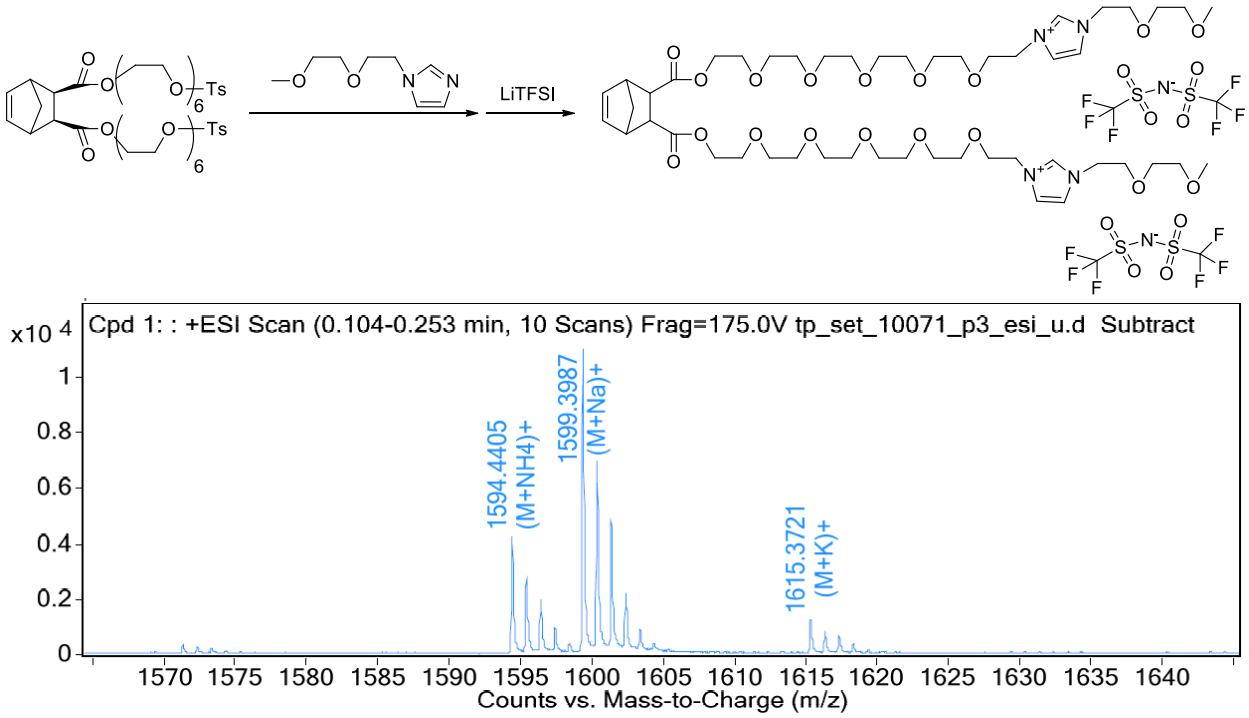


Figure S39c. HR MS of norbornene di(imidazolium) bis(TFSI) NB[C(O)$OE_4Im^+EO_4CH_3$]$_2$ ($TFSI^-$)$_2$ (**8t**).



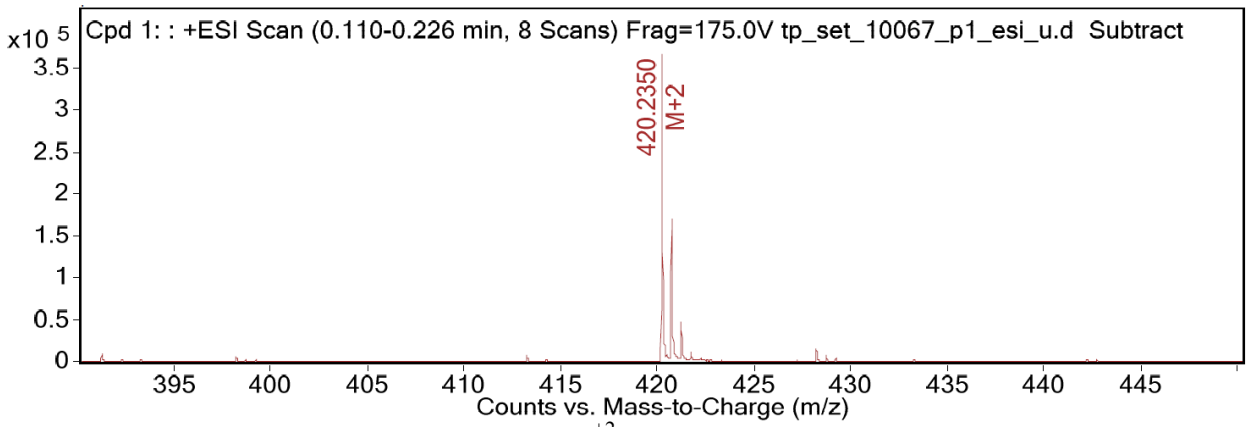
HR MS: calc. for $C_{49}H_{76}O_{24}N_6S_4F_{12}$ $[M - 2TFSI]^{+2}$: m/z 464.2623; found: m/z 464.2609 (error –3.0 ppm).

Figure S40. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_5Im^+EO_2Me]_2(TFSI^-)_2$ (**8u**).



HR MS: calc. for $C_{53}H_{84}O_{26}N_6S_4F_{12}$ $[M + Na]^{+1}$: m/z 1599.4024; found: m/z 1599.3987 (error 2.3 ppm).

Figure S41. HR MS of norbornene di(imidazolium) bis(TFSI) $NB[C(O)OE_6Im^{+}EO_2Me]_2(TFSI^{-})_2$ (**8v**).



HR MS: calc. for $C_{55}H_{82}N_4O_{20}S_2$ $[M - 2\ OTs]^{+2}$: m/z 420.2361; found: m/z 420.2350 (error 2.6 ppm).

Figure S42. HR MS of norbornene di(imidazolium) ditosylate $NB[C(O)OE_4Im^+EO_2Me]_2(Tos^-)_2$ (**7r**).

Discussion of Relationship Between RT Conductivity and T_g

We conclude that a long oxyethylene linkage between the norbornene and the imidazolium cation is desirable, so that steric crowding between the two arms can be reduced and additional intramolecular interactions can be achieved. The ethyleneoxy tail units also then can wrap around the cation for a stabilizing effect. This hypothesis can also serve as an explanation as to why for X = 1 in **Figure S43** the RT conductivity is a smooth function of T_g as Y varies: the highest conductivity for the lowest T_g. In this case the conductivity is controlled by T_g. However, for X = 2, 3, and 4 the relationships are different. We surmise that when X = 1 the steric crowding at the two cations prevents the terminal ethyleneoxy chain from interacting effectively with the imidazolium unit. But once a spacer of at least two oxyethylene units ($X \geq 2$) is employed, the terminal di(ethyleneoxy) tail can arch back to stabilize the less hindered cations and moreover the tether itself can interact with the cation. This complexation of the cation promotes release of the anion, thus increasing the number of charge carriers, and affording increased conductivity; however, the effect on T_g is more complex, because interactions of the tether and terminal ethyleneoxy units with the cation are competitive and result in restricted conformations that raise T_g. However, as Y increases the charge density is diluted, reducing conductivity, so that for $X > 1$ the maximum RT conductivity is observed at Y=2, regardless of the value of X.

Figure S44 shows the effect of variation of the tether length X at constant terminal unit length Y. Consistent with the above discussion for the butyl and Y = 1 cases the RT conductivity follows T_g in the conventionally expected manner. However,

this dramatically changes for Y > 1. The RT conductivity for Y = 2 displays significant scatter and for Y = 3 the RT conductivity is more or less linear with T_g! For Y = 4 a maximum is observed in the plot. For all cases, Y = 1 to 4 the maximum RT conductivities are observed with X = 3 or 4. These results are interpreted as representing competition between the tether and terminal moieties for complexation of the cation and the conformational complexity that evolves with the changing structures. Complexation of either segment would result in loss of conformational freedom and thus increase T_g above the otherwise expected value.

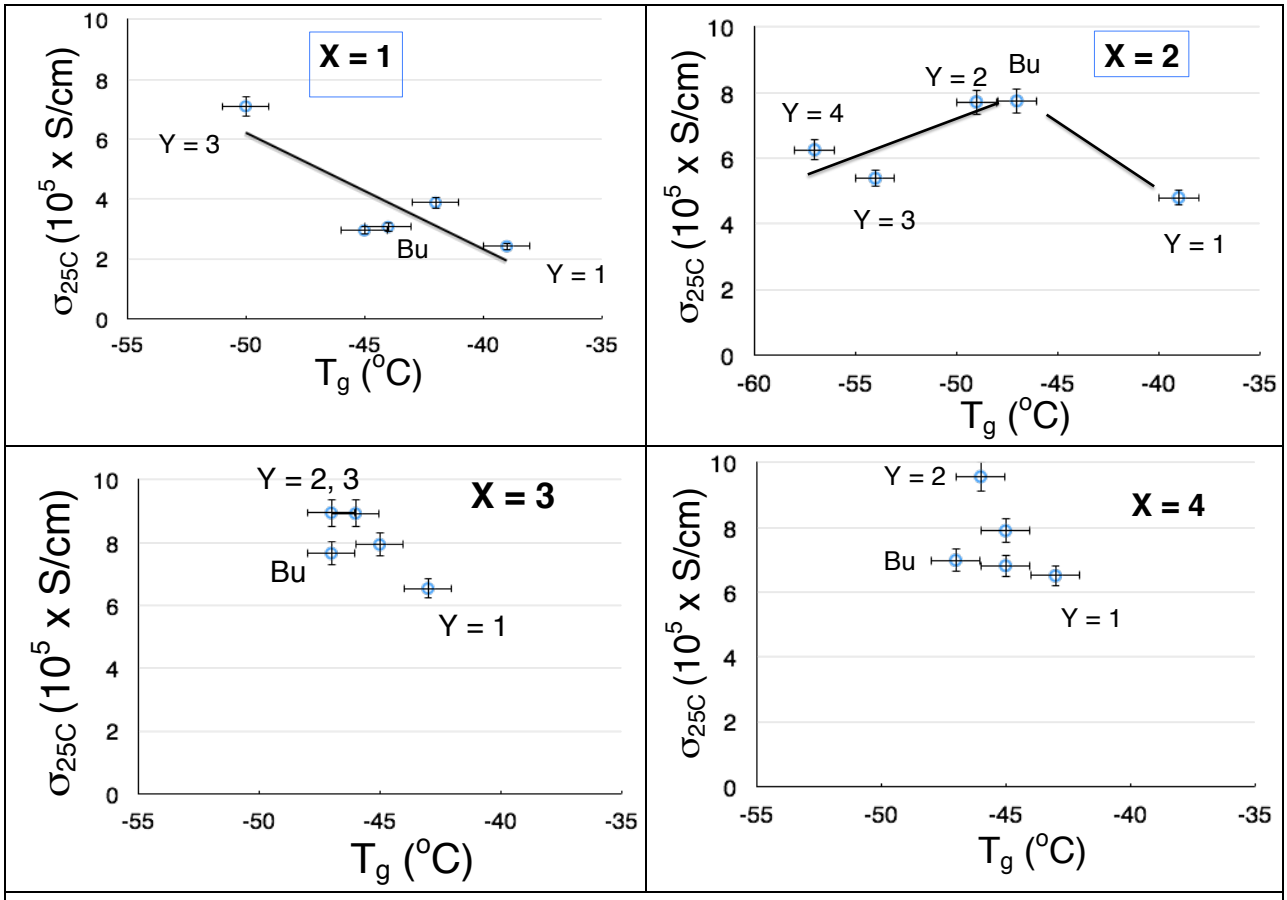


Figure S43. Plots of σ_{25C} versus T_g for series with constant X values and variable Y values. Error bars in $T_g \pm 1$ °C and in σ_{25C} ± 5% relative.

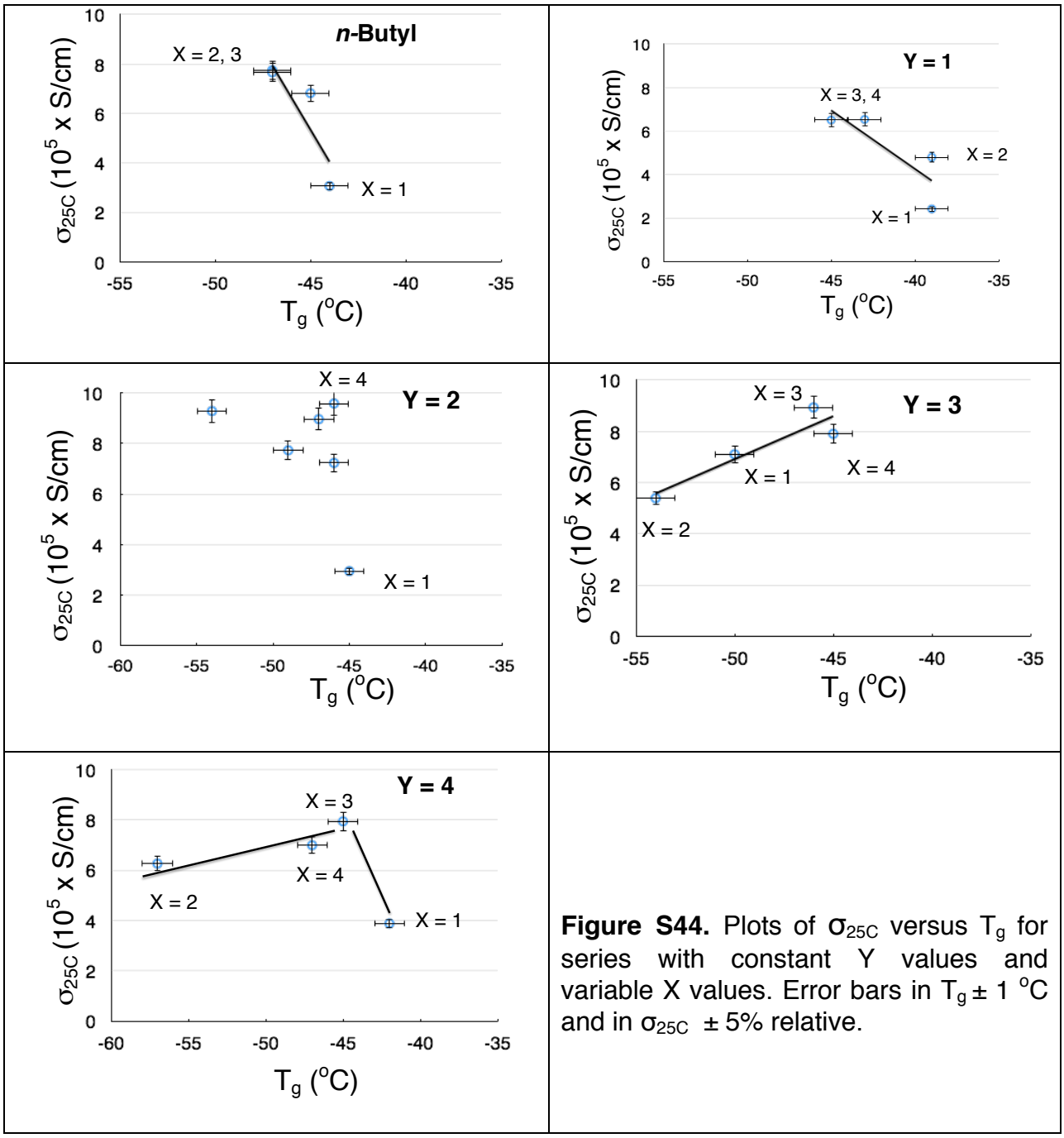


Figure S44. Plots of σ_{25C} versus T_g for series with constant Y values and variable X values. Error bars in $T_g \pm 1$ °C and in σ_{25C} ± 5% relative.

Solvent Effects on Chemical Shifts of N,N'-Dimethylimiazolium TFSI

To aid in the understanding the NMR results for the monomers in various solvents, dimethylimidazolium TFSI was studied in ether, glyme, diglyme, triglyme, and tetraglyme (**Figure S45**) by ^{1}H NMR (**Figure S46**). Dimethylimidazolium TFSI was dissolved in each of the solvents to form 0.27 mM solutions. A sealed capillary containing chloroform-*d* served as an external standard (δ = 7.26 ppm). As the number of oxygen atoms in the solvent increased, the proton peaks of the imidazolium unit were steadily shifted upfield. H_1 was used for analysis because its chemical shift change was greatest and because it is the most acidic hydrogen. The shifting of imidazolium protons upfield indicates the degree to which hydrogen bonding is occurring between the acidic protons of the imidazolium ring and oxygen atoms of the solvent. **Figure S47** shows the dependence of the chemical shift on the concentration of ether oxygen atoms, supporting this interpretation.

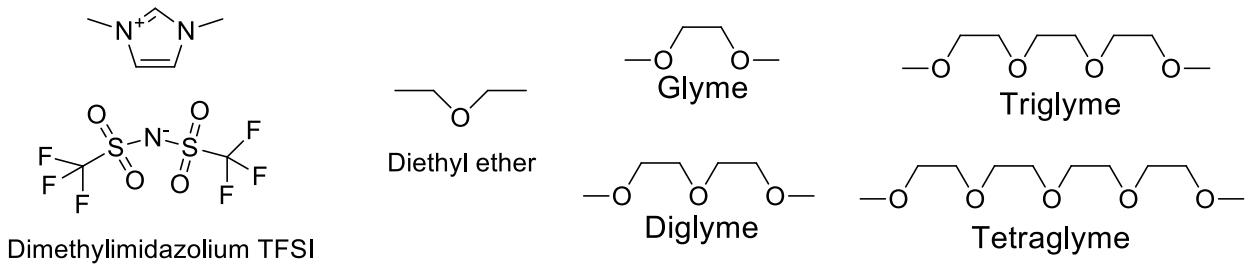


Figure S45. Ethereal solvents used to probe intermolecular interactions between the N,N'-dimethylimidazolium cation and ethyleneoxy units.

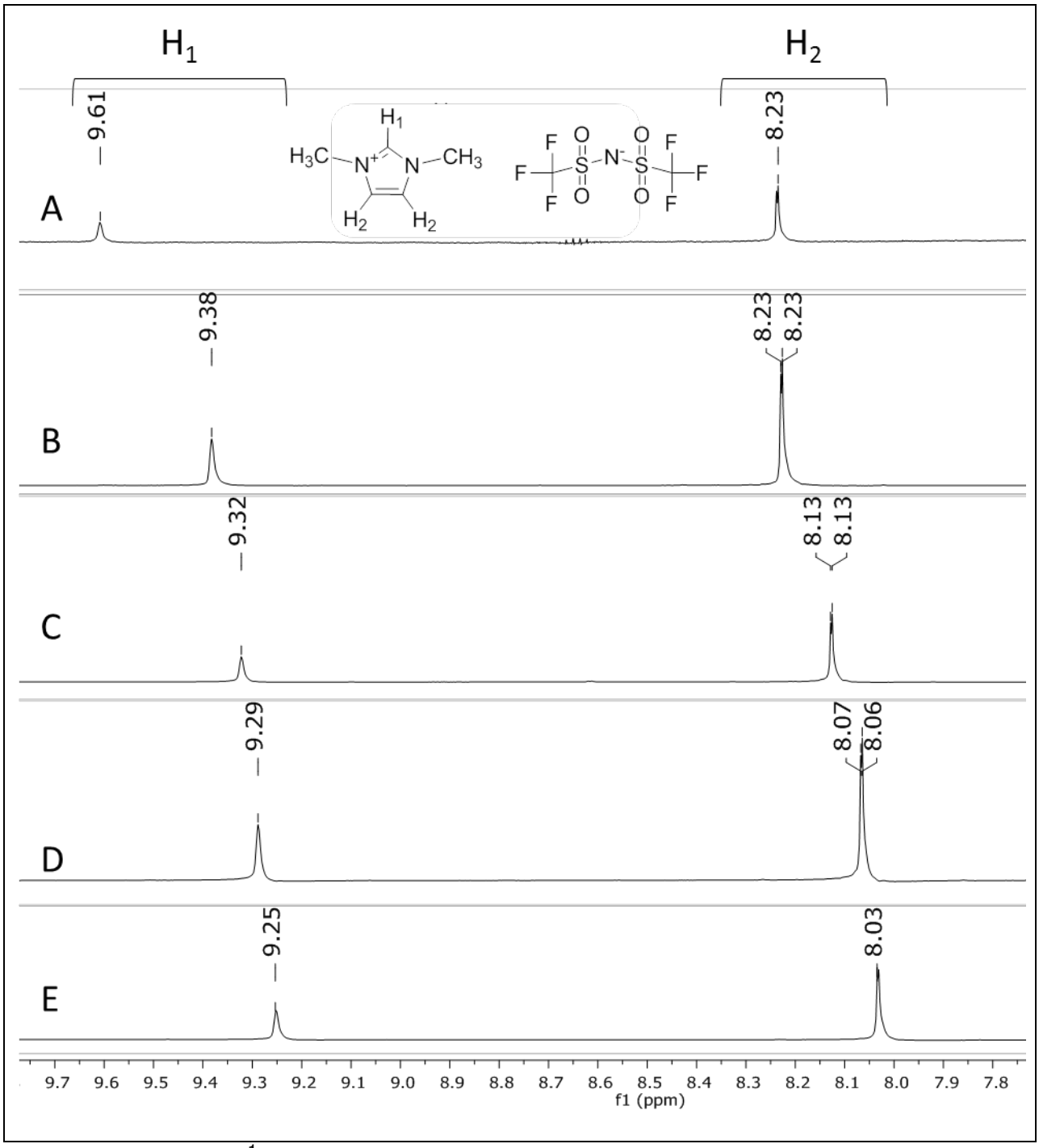


Figure S46. Partial ^{1}H NMR (500 MHz) spectra of dimethyl imidazolium TFSI (0.27 mM) in: A) ether, B) glyme, C) diglyme, D) triglyme, E) tetraglyme.

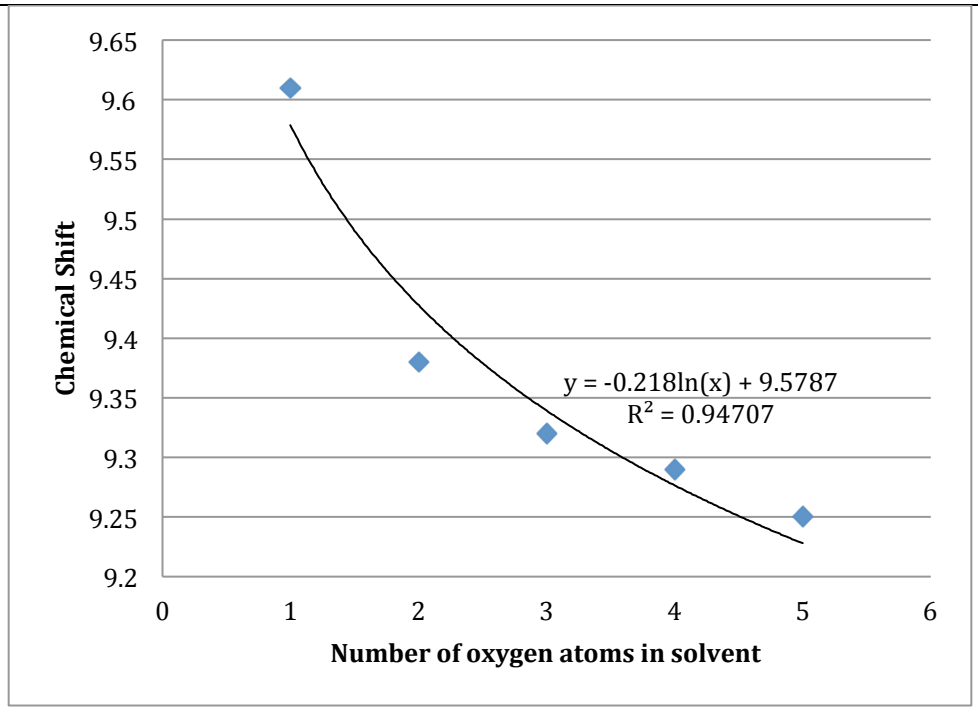
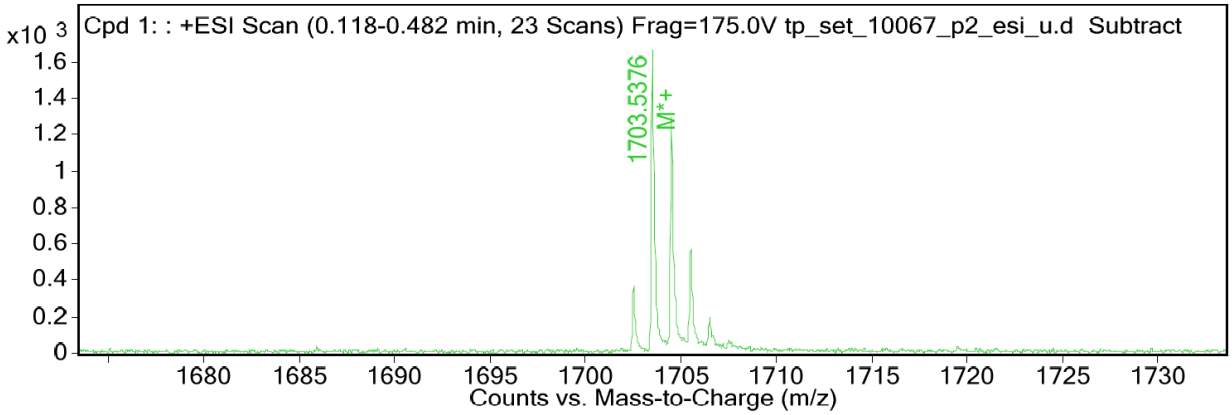


Figure S47. Chemical shift of H_1 of dimethyl imidazolium TFSI vs. oxygen content of the solvent; fit to a logarithmic trend line to guide the eye.

NB[(EO)$_4$Im(EO)$_2$CH$_3$ BARF]$_2$



HR MS: calc. for $C_{105}H_{92}B_2N_4O_{14}F_{48}$ [M - BARF]$^+$: m/z 1703.5375; found: m/z 1703.5376 (error –0.06 ppm)

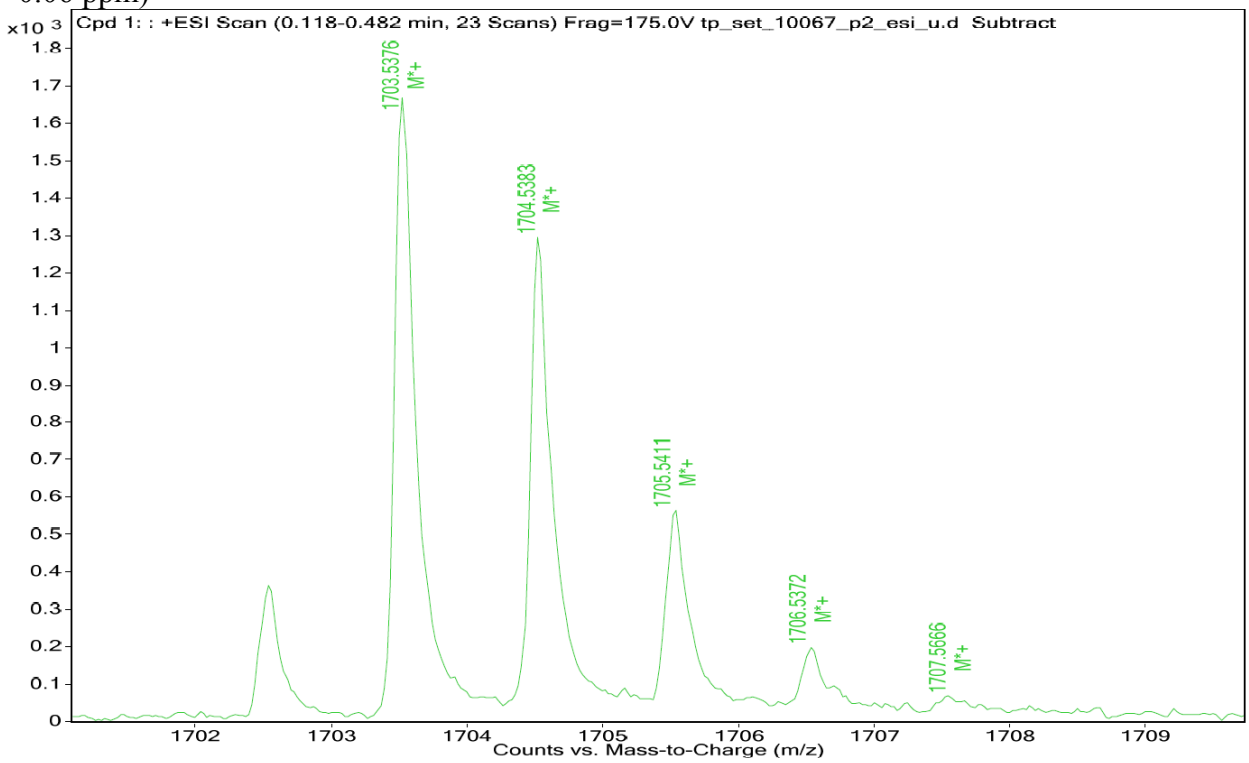
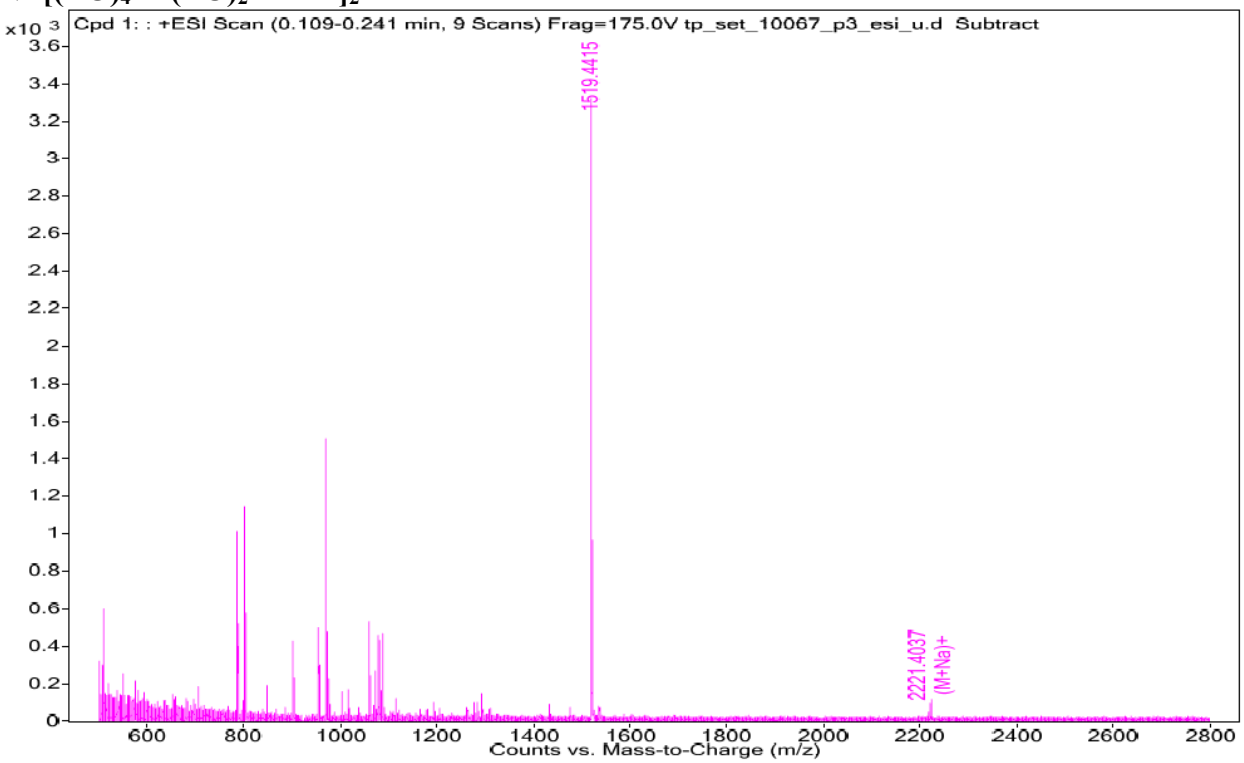


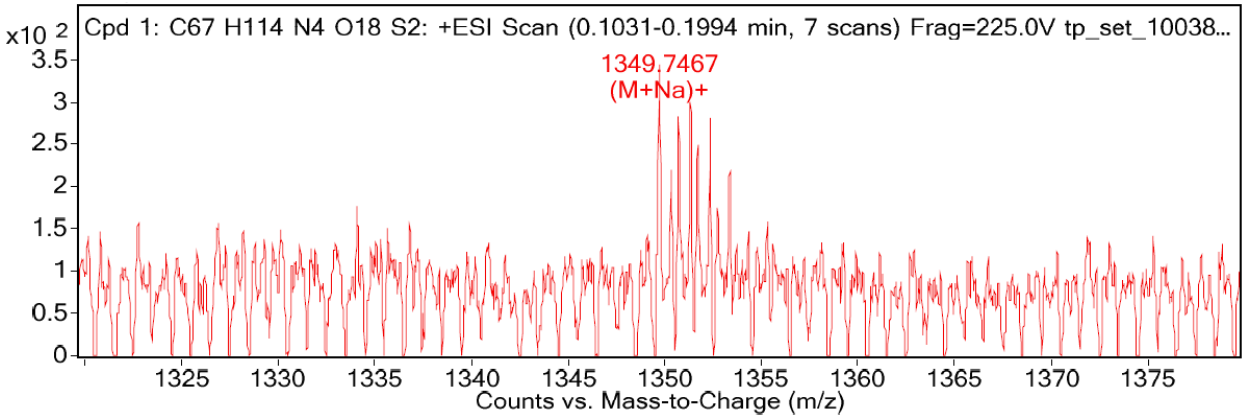
Figure S48. HR MS of norbornene di(imidazolium) bis(BARF) NB[C(O)OE$_4$Im$^+$EO$_2$Me]$_2$ (BARF$^-$)$_2$ (**9r**).

NB[(EO)$_4$Im(EO)$_2$ TPFB]$_2$



HR MS: calc. for $C_{65}H_{68}BF_{20}N_4O_{14}$ [M - TPFB]$^+$: m/z 1519.4506; found: m/z 1519.4415 (error 6.0 ppm)

Figure S49. HR MS of norbornene di(imidazolium) bis(TFPB) NB[C(O)OE$_4$Im$^+$EO$_2$Me]$_2$ (TFPB$^-$)$_2$ (**10r**).



HR MS: calc. for $C_{67}H_{114}N_4O_{18}S_2$ $[M + Na]^+$: m/z 1349.7462; found: m/z 1349.7467 (error –0.4 ppm)

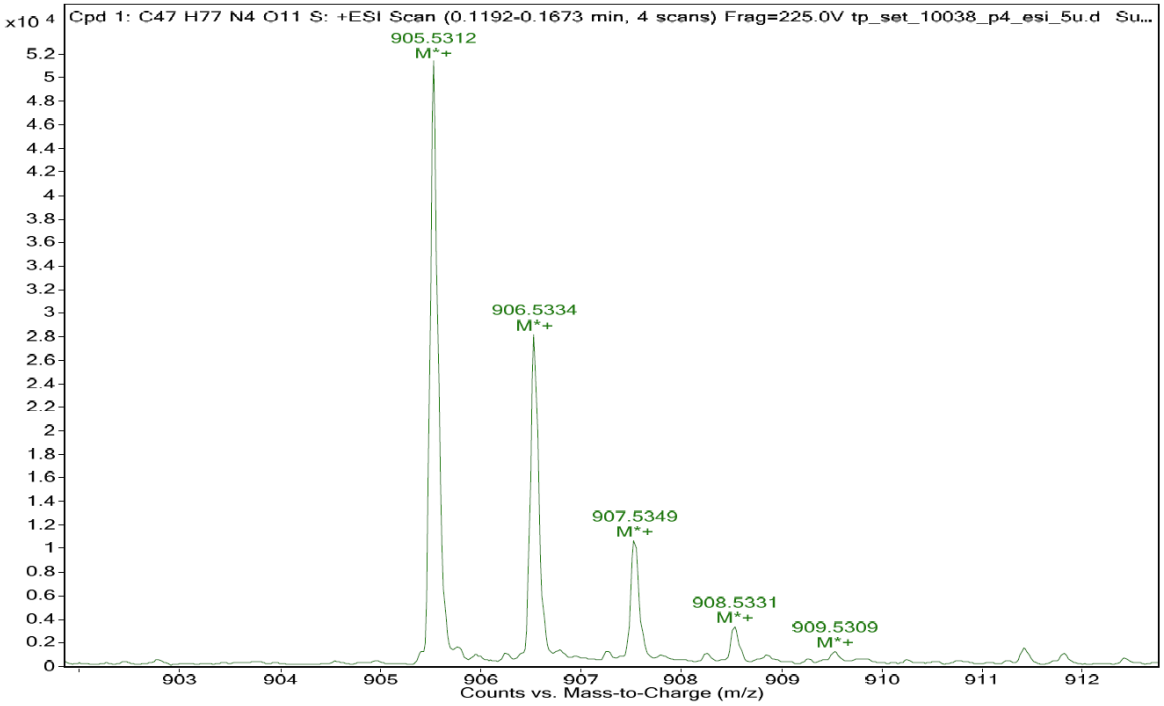
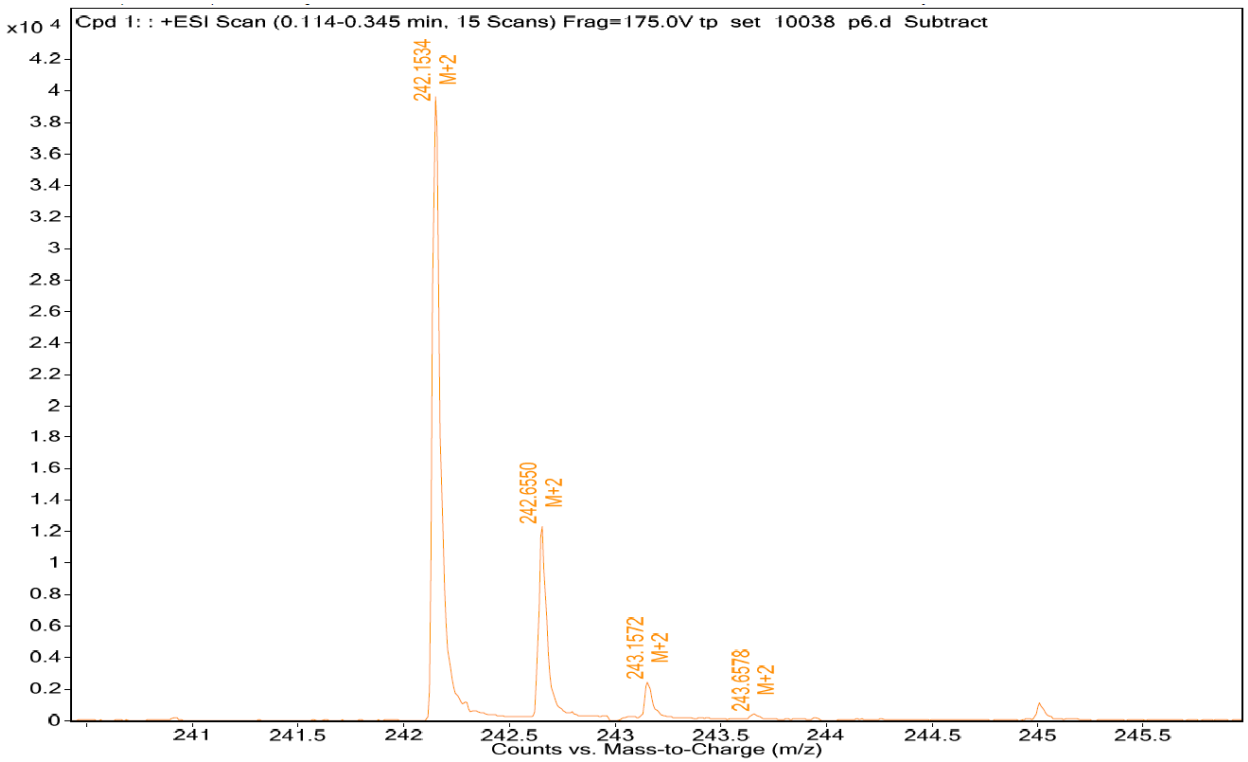


Figure S50. HR MS of norbornene di(imidazolium) bis(AOT) NB[C(O)OEIm$^+$Bu]$_2$ (AOT$^-$)$_2$ (**11a**).



HR MS: calc. for $C_{47}H_{82}N_4O_{12}S_2$ [M – 2 DDS]$^{+2}$: m/z 242.1520; found: m/z 242.1534 (error –5.8 ppm)

Figure S51. HR MS of norbornene di(imidazolium) bis(DDS) NB[C(O)OEIm^{+}Bu]$_2$ (DDS^{-})$_2$ (**12a**).

Table S1. Glass transition temperatures and room temperature conductivities of **8r**, **9r, 10r**, **8a**, **11a** and **12a.**

Cpd.	Anion	Name	T_g * (^oC)	Conductivity @ 25 ^oC (S/cm)
8r	TFSI	$NB[C(O)OE_4Im^+EO_2Me]_2\,(TFSI^-)_2$	–46 °C	9.57×10^{-5}
9r	BARF	$NB[C(O)OE_4Im^+EO_2Me]_2\,(BARF^-)_2$	–26, –6 °C	3.19×10^{-8}
10r	TPFB	$NB[C(O)OE_4Im^+EO_2Me]_2\,(TPFB^-)_2$	–27 °C	N/A
8a	TFSI	$NB[C(O)OEIm^+Bu]_2\,(TFSI^-)_2$	–44 °C	3.07×10^{-5}
11a	AOT	$NB[C(O)OEIm^+Bu]_2\,(AOT^-)_2$	–25 °C	2.57×10^{-9}
12a	DSS	$NB[C(O)OEIm^+Bu]_2\,(DDS^-)_2$	5 °C	1.24×10^{-10}

* Determined by DSC at 10 ^oC/min during the second heating scan. The midpoint of the change in heat capacity was defined as the glass transition temperature.

Table S1 lists T_g and RT conductivity values for these monomer salts. The T_gs of **9r** and **10r** with the boron anions are approximately 20 °C higher than their TFSI counterpart **8r** and RT conductivities are nearly three orders of magnitude lower. The increased T_g values yield a medium less favorable for mass transport of these large anions. Considering the similar T_g value of **9r** and **10r** alongside the low RT conductivity of **9r** and the cost of NaTPFB (~ $1/2 mg), its conductivity was not measured since more material is required. For the sulfonate **11a** and sulfate **12a**, T_g values are nearly 20 and 50 °C higher and RT conductivities range from four to five orders of magnitude lower than their TFSI counterpart **8a**. The T_g increase in **9r** and **10r** is likely in part due to the large and rigidly confined aromatic rings. The anions of **11a** and **12a**, however, contain flexible hydrocarbon chains, so the lower conductivity in these systems is attributed mainly to the lack of charge delocalization in the sulfonate

and sulfate anions, leading to tighter ion pairs and fewer free anions and a lower dielectric constant.

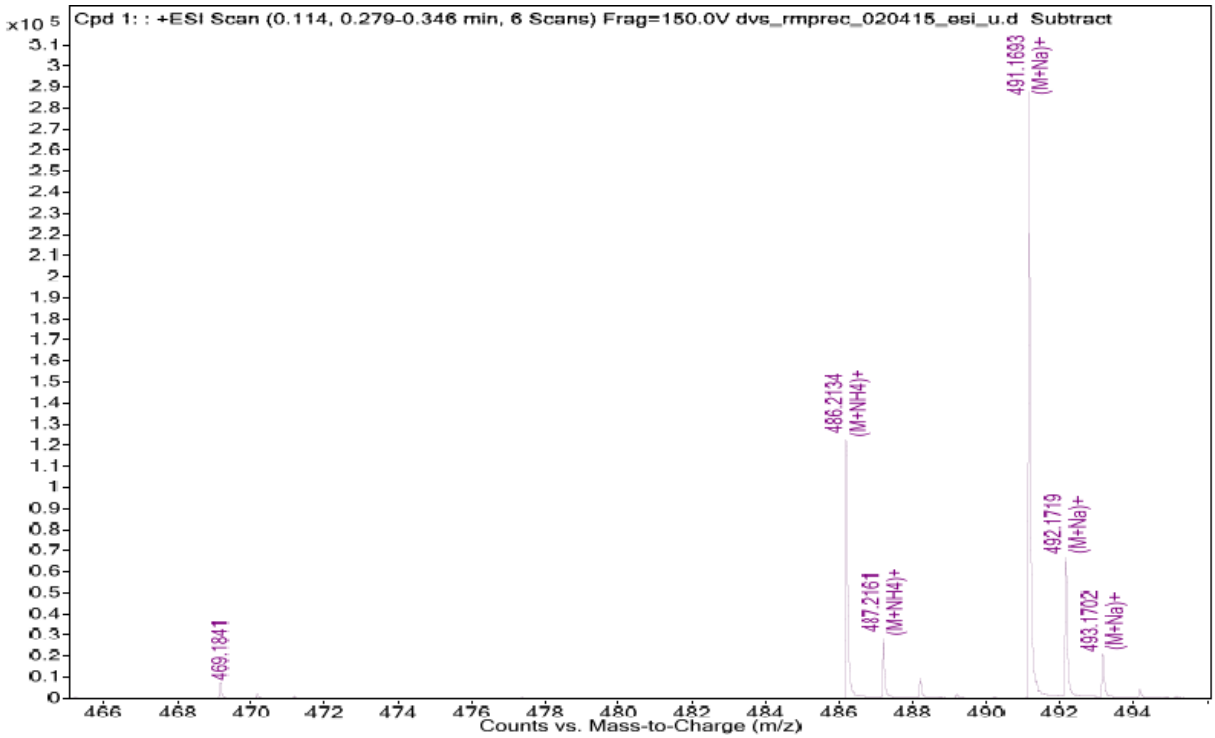


Figure S52. HR MS of norbornene monotosylate NBC(O)OE$_4$OTs (**14**).

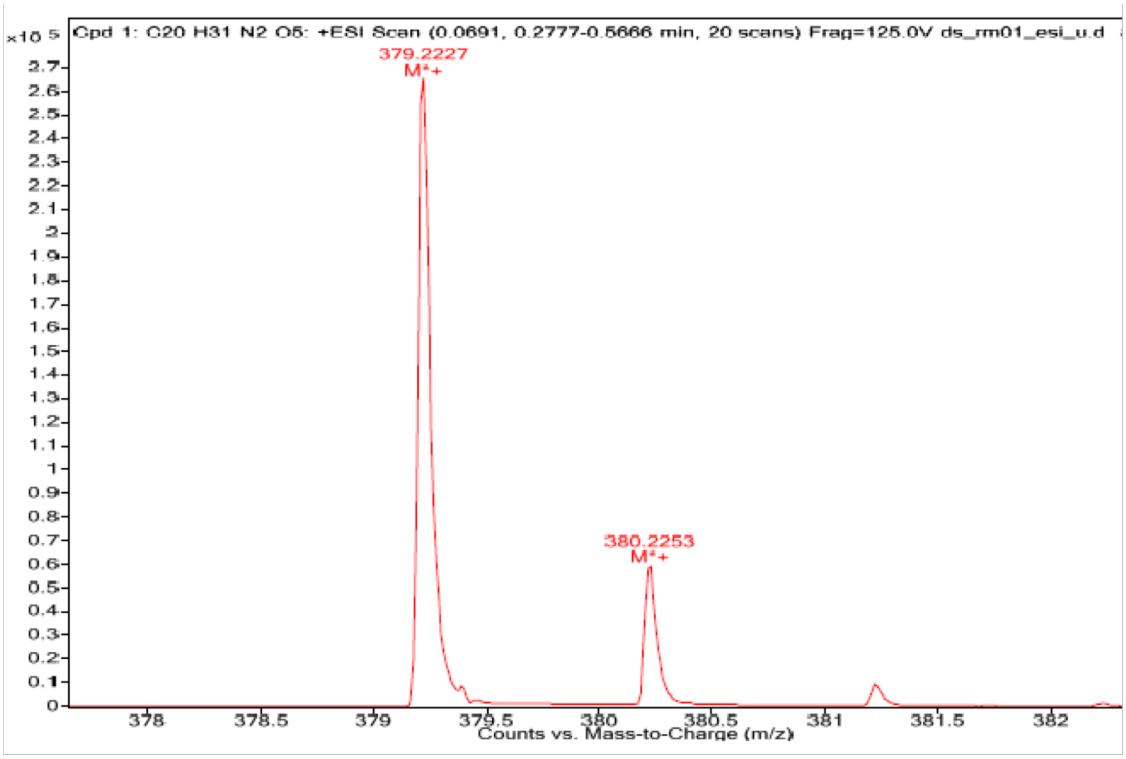


Figure S53. HR MS of monomer NBC(O)OE$_4$ImMe$^+$ TFSI$^-$ (**15a**).

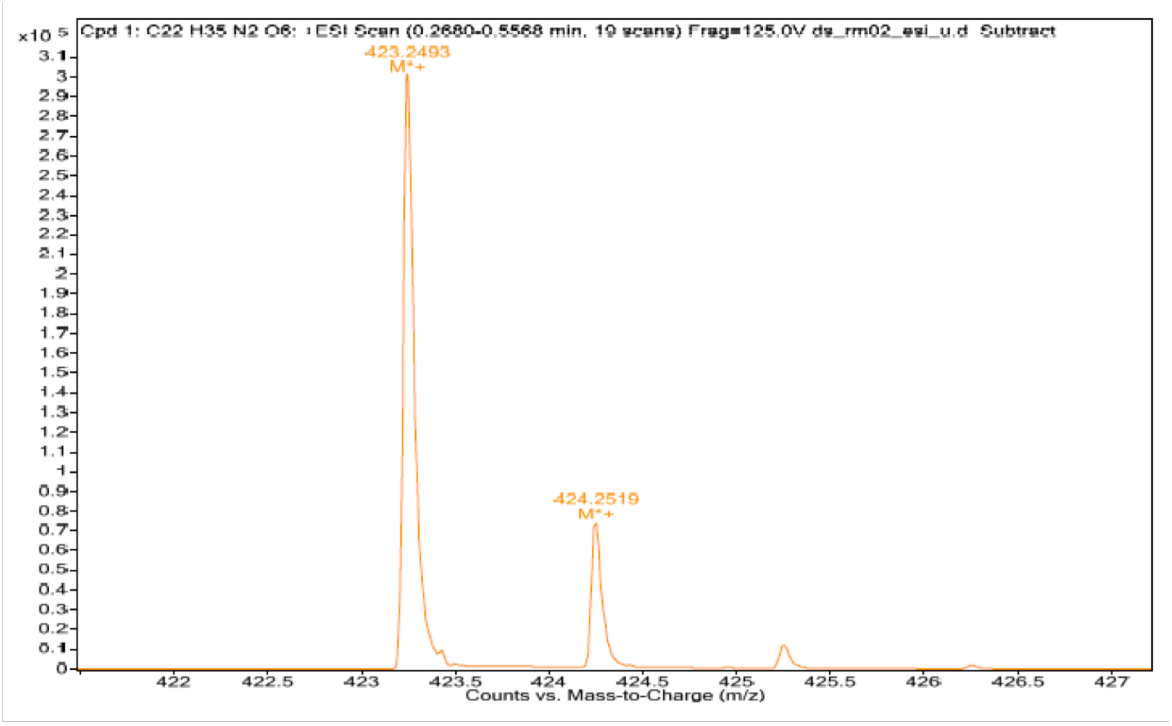


Figure S54. HR MS for monomer NBC(O)OE$_4$Im$^+$EOMe TFSI$^-$ (**15b**).

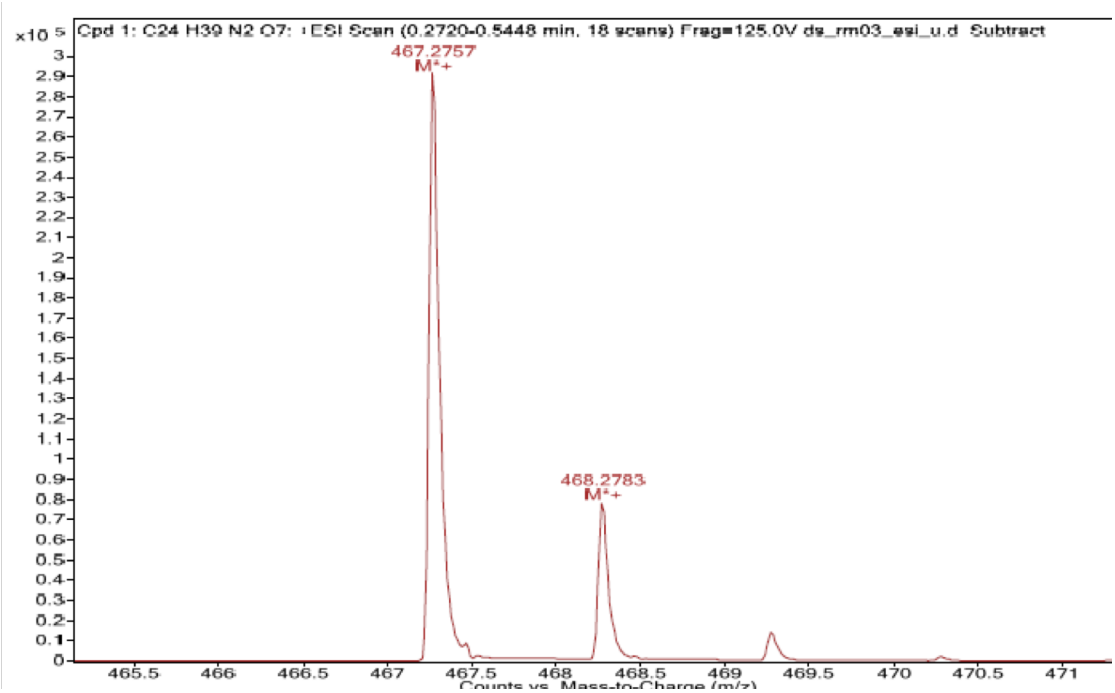


Figure S55. HRMS for monomer NBC(O)OE$_4$Im$^+$EO$_2$Me TFSI$^-$ (**15c**).

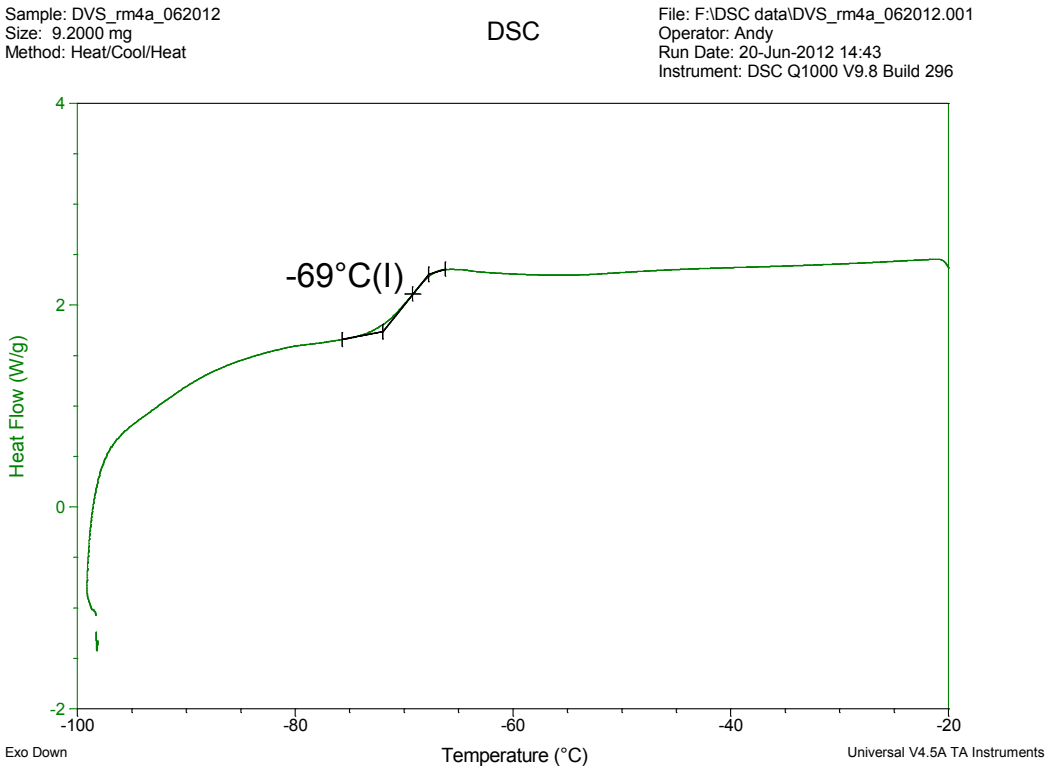


Figure S56. DSC trace for the monomer NBC(O)OE$_4$Im$^+$EO$_2$Me TFSI$^-$ (**15c**) with a T_g of -69 ^{0}C. Second heating cycle shown.

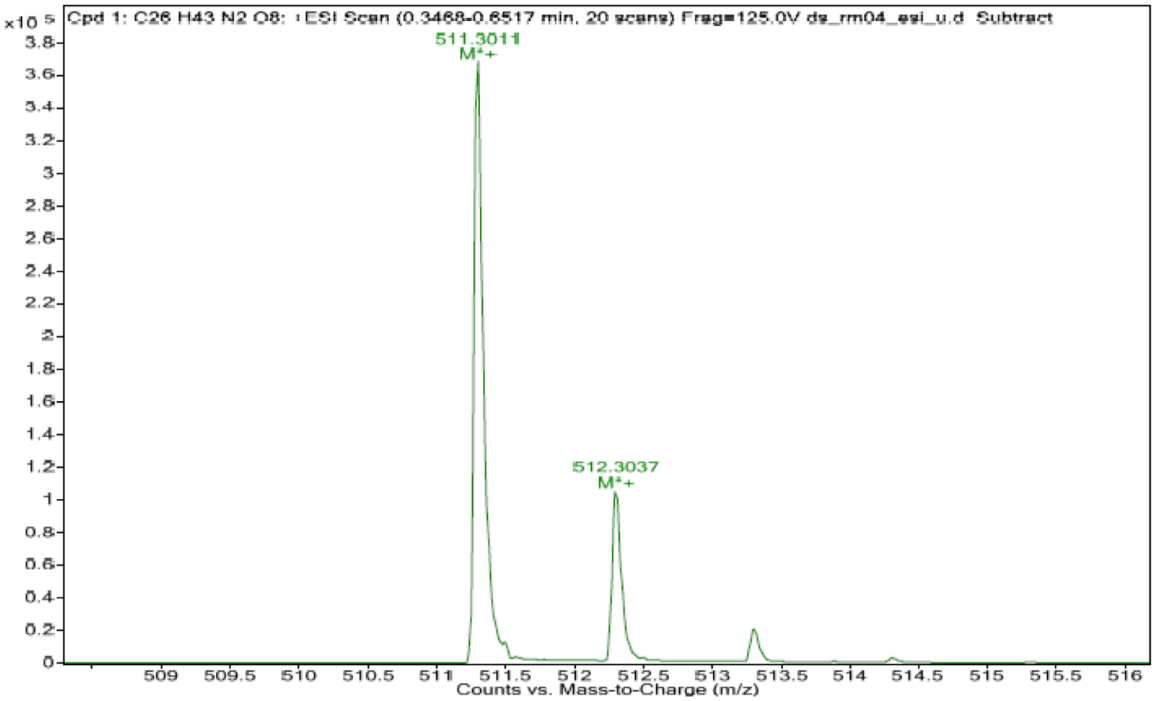
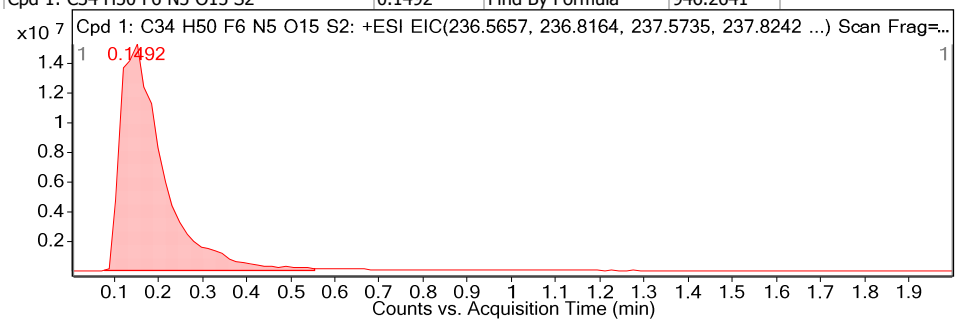


Figure S57. HR MS of norbornene mono(imidazolium) TFSI NBC(O)OE$_4$Im$^+$EO$_3$Me TFSI$^-$ **(15d)**.

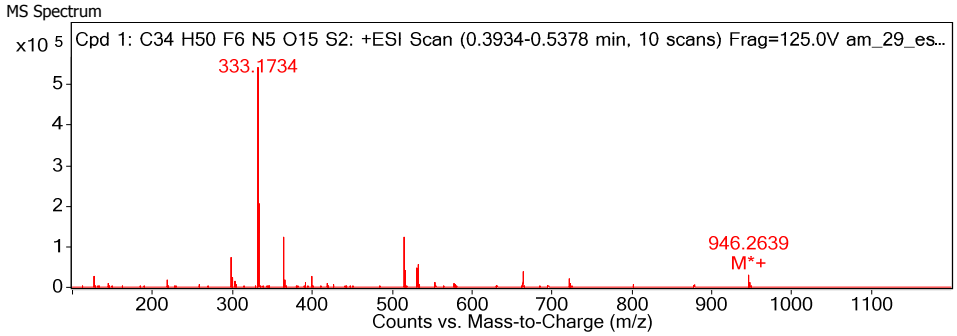
Compound Table

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C34 H50 F6 N5 O15 S2	0.1492	946.2641	29032	C34 H50 F6 N5 O15 S2	946.2649	-0.89

Compound Label	RT	Algorithm	Mass
Cpd 1: C34 H50 F6 N5 O15 S2	0.1492	Find By Formula	946.2641



MS Spectrum



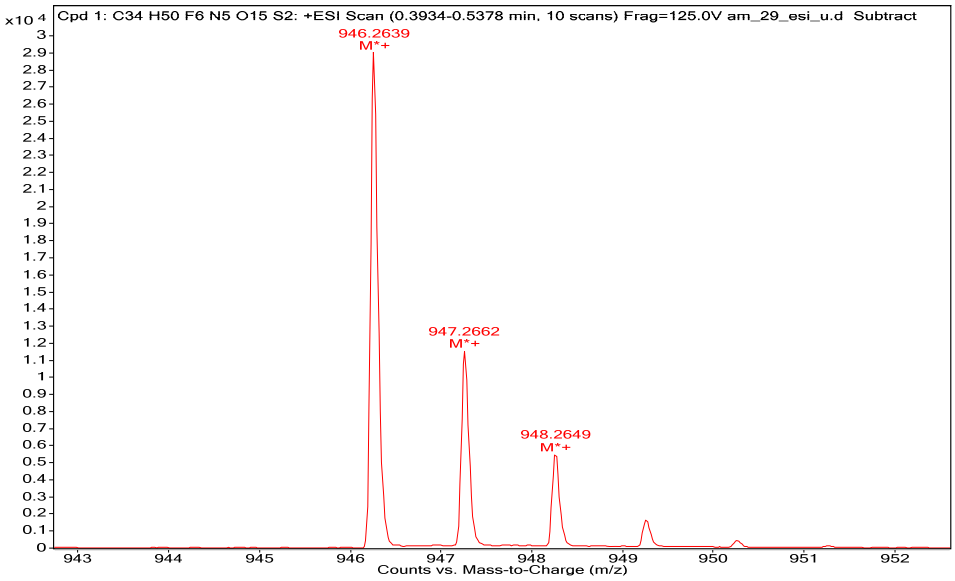
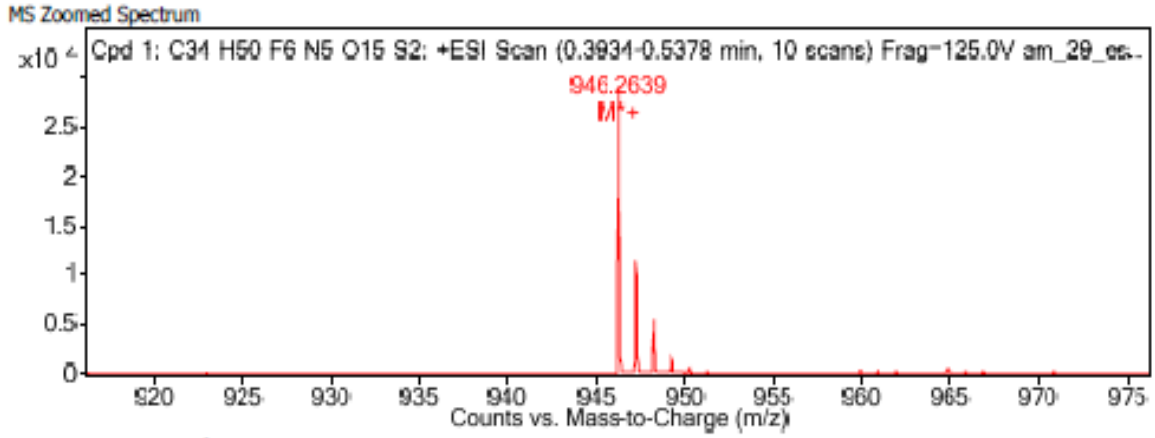


Figure S58a. HR MS of oxaorbornene di(imidazolium) bis(TFSI) ONB[C(O)OE$_3$Im$^+$EOMe]$_2$ (TFSI$^-$)$_2$ **(18a)**.



MS Spectrum Peak List

m/z	*Calc m/z*	Diff(ppm)	z	Abund	Formula	Ion
333.1734				545139		
333.3331				18819		
333.3995				4065		
333.6747				204775		
333.8357				6750		
334.1757				48091		
334.6766				9527		
946.2639	946.2644	-0.46	1	29048	C34 H50 F6 N5 O15 S2	M*+
947.2662	947.2673	-1.24	1	11556	C34 H50 F6 N5 O15 S2	M*+
948.2649	948.2656	-0.7	1	5564	C34 H50 F6 N5 O15 S2	M*+

Figure S58b. HR MS of oxaorbornene di(imidazolium) bis(TFSI) ONB[C(O)OE$_3$Im$^+$EOMe]$_2$ (TFSI$^-$)$_2$ **(18a)**.

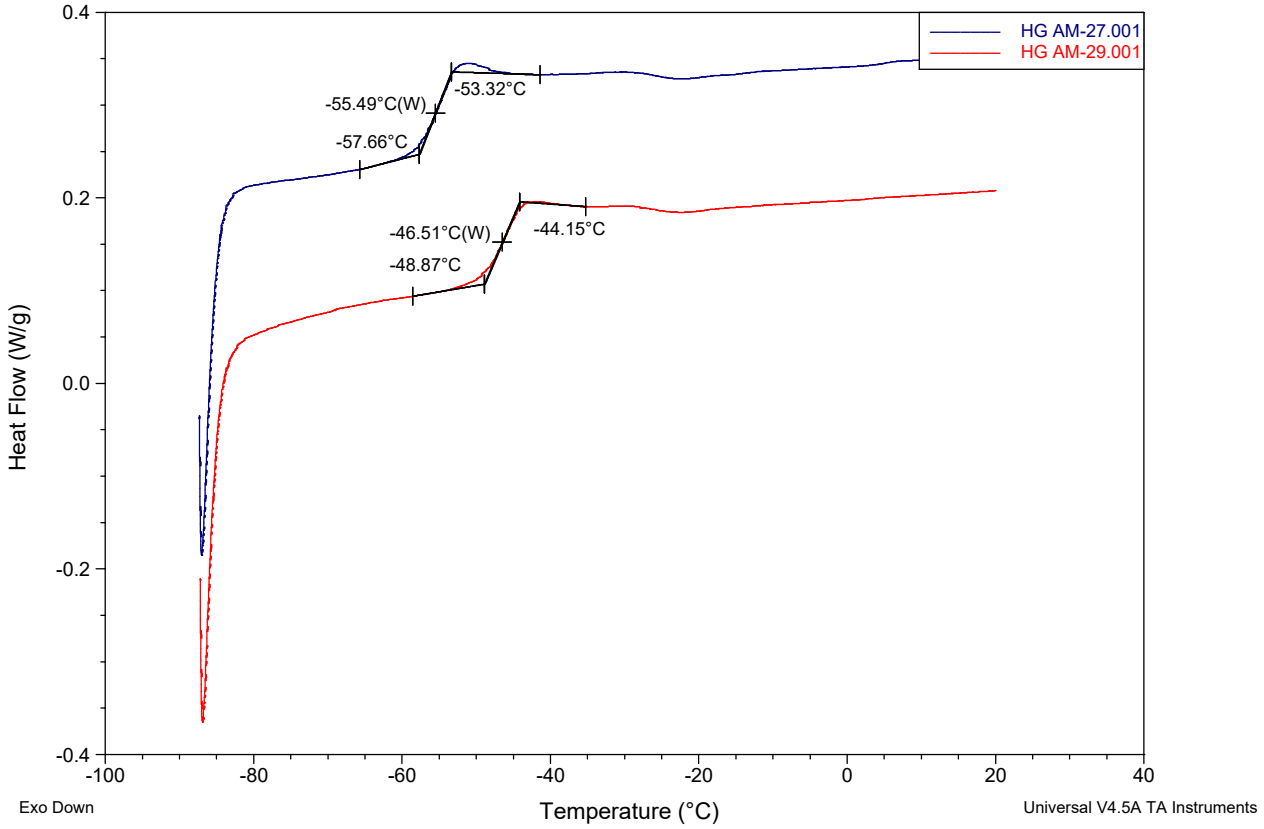
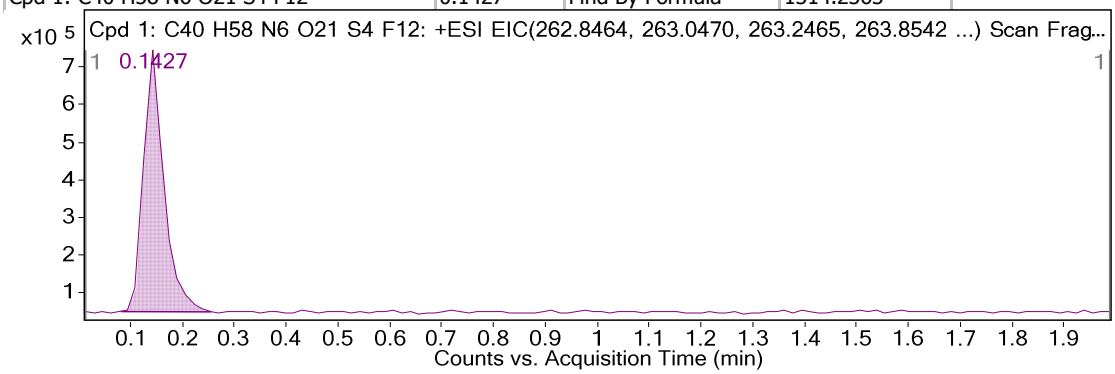


Figure S59. DSC trace of oxaorbornene di(imidazolium) bis(TFSI) ONB[C(O)OE$_3$Im$^+$EOMe]$_2$ (TFSI$^-$)$_2$ **(18a)** (red curve labelled HG AM 29 001).

Compound Table

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C40 H58 N6 O21 S4 F12	0.1427	1314.2363	24489	C40 H58 N6 O21 S4 F12	1314.2346	1.28

Compound Label	RT	Algorithm	Mass
Cpd 1: C40 H58 N6 O21 S4 F12	0.1427	Find By Formula	1314.2363



MS Spectrum

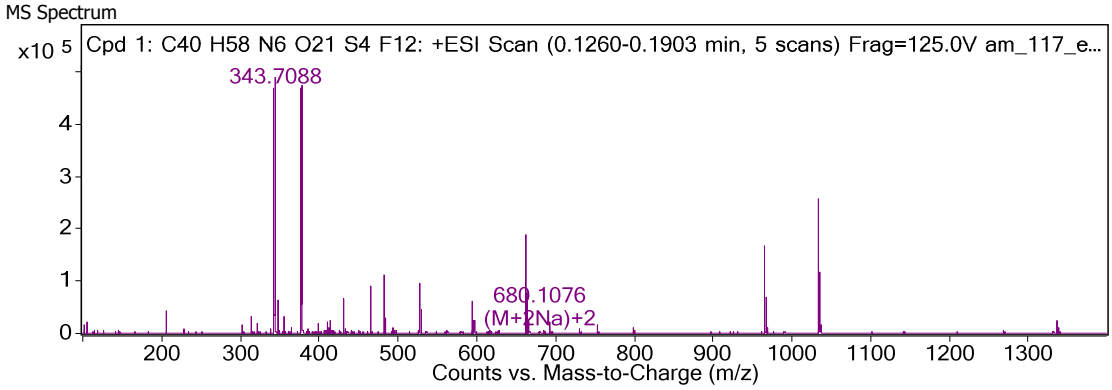


Figure S60a. HR MS of oxaorbornene di(imidazolium) bis(TFSI) ONB[C(O)OE$_4$Im$^+$EOMe]$_2$ (TFSI$^-$)$_2$ **(18b)**.

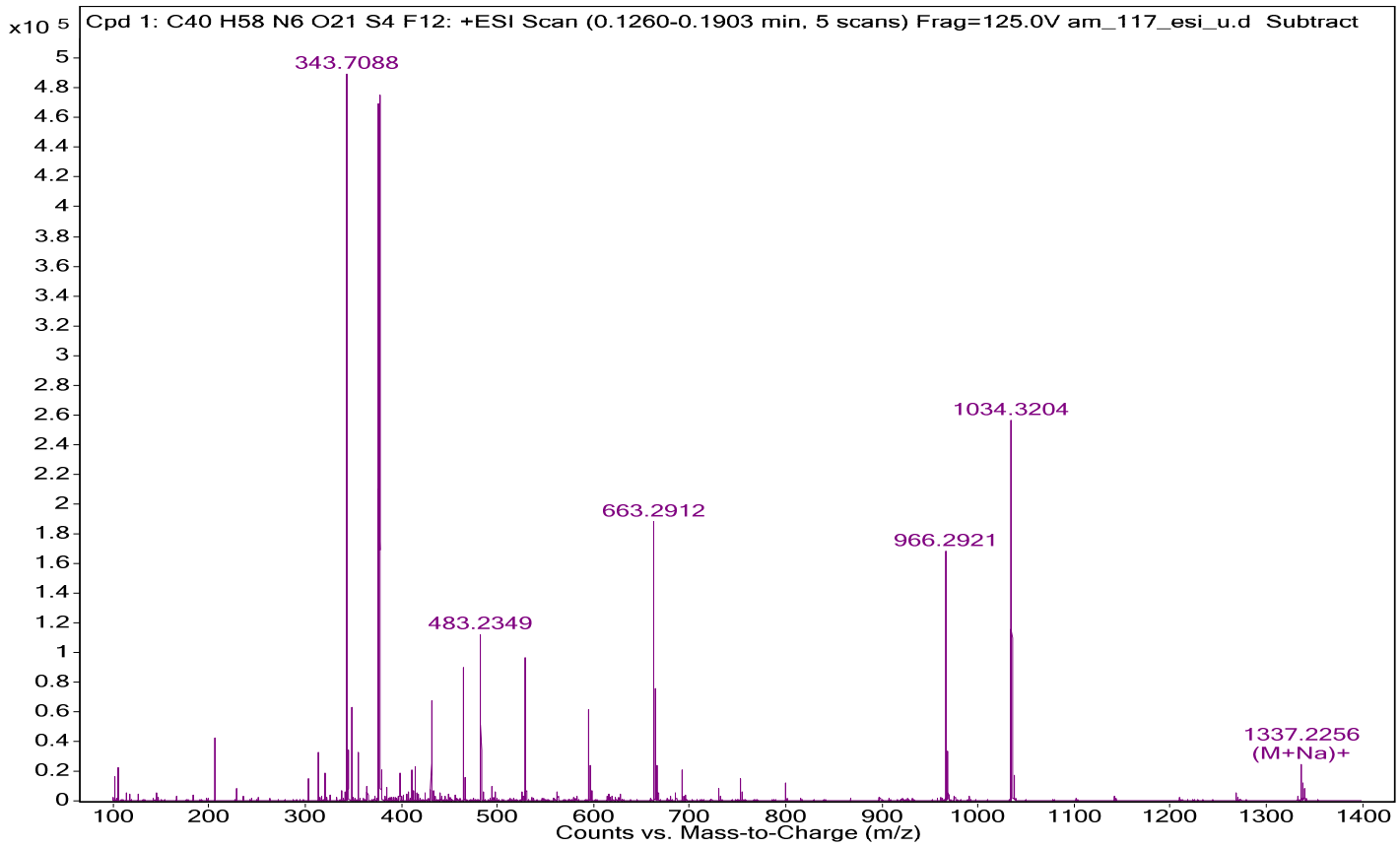
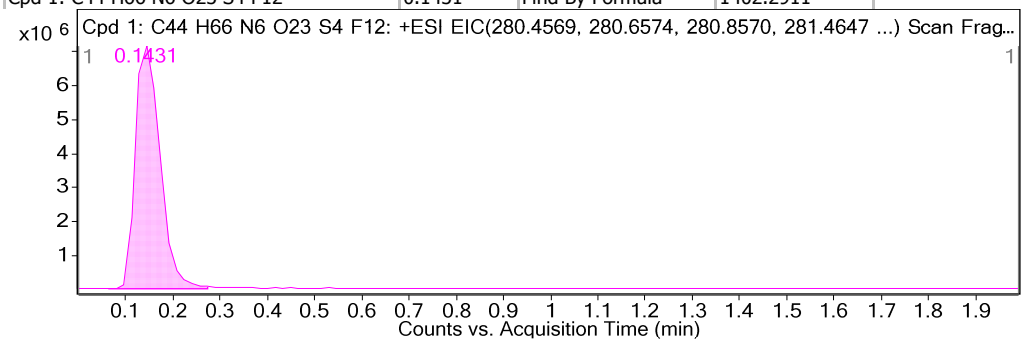


Figure S60b. HR MS of oxaorbornene di(imidazolium) bis(TFSI) ONB[C(O)OE$_4$Im$^+$EOMe]$_2$ (TFSI$^-$)$_2$ (**18b**).

Compound Table

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C44 H66 N6 O23 S4 F12	0.1431	1402.2911	249787	C44 H66 N6 O23 S4 F12	1402.2871	2.88

Compound Label	RT	Algorithm	Mass
Cpd 1: C44 H66 N6 O23 S4 F12	0.1431	Find By Formula	1402.2911



MS Spectrum

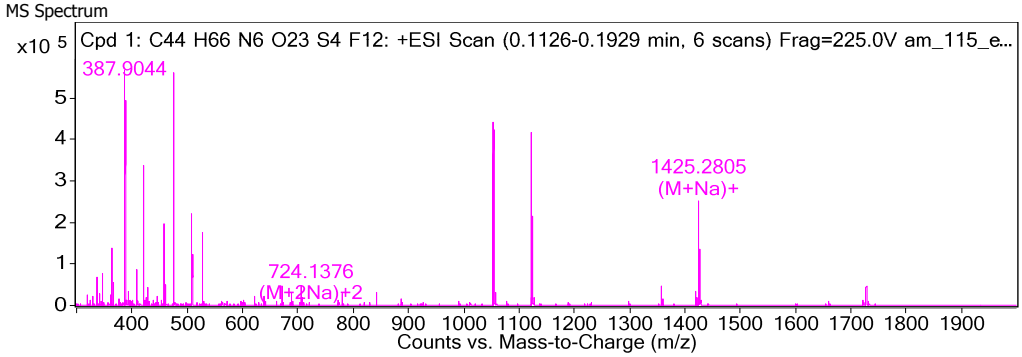
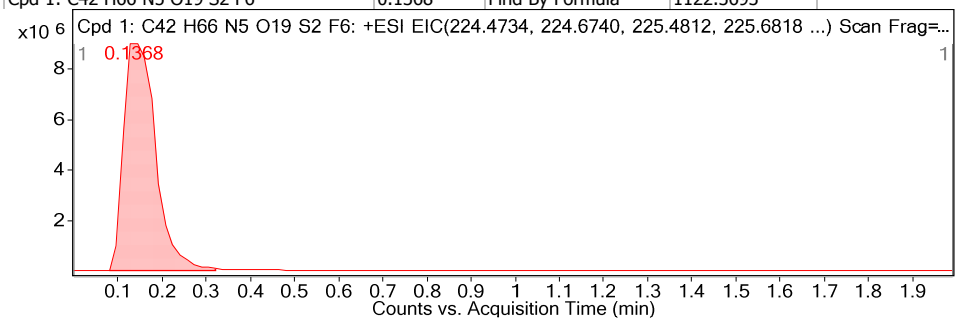


Figure S61a. HR MS of oxaorbornene di(imidazolium) bis(TFSI) ONB[C(O)OE$_4$Im$^+$EO$_2$Me]$_2$ (TFSI$^-$)$_2$ **(18c)**.

Compound Table

Compound Label	RT	Mass	Abund	Formula	Tgt Mass	Diff (ppm)
Cpd 1: C42 H66 N5 O19 S2 F6	0.1368	1122.3693	297217	C42 H66 N5 O19 S2 F6	1122.3698	-0.39

Compound Label	RT	Algorithm	Mass
Cpd 1: C42 H66 N5 O19 S2 F6	0.1368	Find By Formula	1122.3693



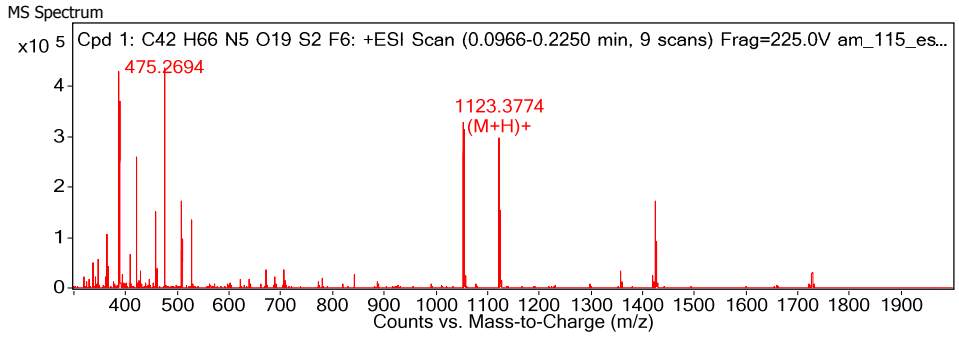


Figure S61b. HR MS of oxaorbornene di(imidazolium) bis(TFSI) ONB[C(O)OE$_4$Im$^+$EO$_2$Me]$_2$ (TFSI$^-$)$_2$ **(18c)**.

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S1. Smith, T. W.; Zhao, Meng; Y., Fan; Smith, D.; Cebe, P. Imidazole polymers derived from ionic liquid 4-vinylimidazolium monomers: their synthesis and thermal and dielectric properties, *Macromolecules* **2013**, *46*, 1133-1143.

S2. Yang, Z.-Z.; He, L.-N. Efficient CO_2 capture by tertiary amine-functionalized ionic liquids through Li^+-stabilized zwitterionic adduct formation, *Beilstein J. Org. Chem.* **2014,** *10*, 1959-1966.