

**Biodegradable, non-bactericidal oxygen-functionalised imidazolium  
esters: A step towards ‘greener’ ionic liquids**

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**Supplementary Data**

## Bromide salts

### **3-Methyl-1-(butoxycarbonylmethyl)imidazolium bromide (1a)**

The title compound was prepared from 1-methylimidazole (45.0 mmol, 3.69 g) and butyl 2-bromoacetate (60.0 mmol, 11.7 g) according to the general procedure in 82 % yield (10.17 g, 36.7 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.20 (s, 1H), 7.50 (t,  $J = 1.8$  Hz, 1H), 7.37 (t,  $J = 1.8$  Hz, 1H), 5.42 (s, 2H), 4.15 (t,  $J = 6.7$  Hz, 2H), 4.05 (s, 3H), 1.60 (tt,  $J = 6.7, 7.2$  Hz, 2H), 1.31 (tt,  $J = 7.2, 7.4$  Hz, 2H), 0.87 (t,  $J = 7.4$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.15, 138.65, 123.70, 122.82, 66.85, 50.30, 36.92, 30.33, 18.98, 13.66

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3099, 2961, 2930, 2861, 1751, 1569, 1558, 1495, 1452, 1398, 1217, 1177

MS  $m/z$ , Found 197.1278  $[\text{M}-\text{Br}]^+$ , Calcd.  $\text{C}_{10}\text{H}_{17}\text{N}_2\text{O}_2$  197.1290

MS  $m/z$ , 197.1  $[\text{M}-\text{Br}]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(pentoxycarbonylmethyl)imidazolium bromide (2a)**

The title compound was prepared from 1-methylimidazole (3.69g, 45.0 mmol) and pentyl 2-bromoacetate (54.0 mmol, 11.29 g) according to the general procedure in 97 % yield (12.76 g, 43.8 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.79 (s, 1H), 7.30 (t,  $J = 1.8$  Hz, 1H), 7.23 (t,  $J = 1.8$  Hz, 1H), 4.95 (s, 2H), 4.16 (t,  $J = 6.8$  Hz, 2H), 3.90 (s, 3H), 1.65 (tt,  $J = 6.8, 7.2$  Hz, 2H), 1.30-1.23 (m, 4H), 0.86 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.16, 138.39, 123.79, 123.08, 67.07, 50.30, 36.92, 28.00, 27.79, 22.21, 13.19

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3095, 2959, 2931, 1750, 1578, 1569, 1559, 1495, 1455, 1398, 1230, 1177

MS  $m/z$ , Found 211.1440  $[\text{M}-\text{Br}]^+$ , Calcd.  $\text{C}_{11}\text{H}_{19}\text{N}_2\text{O}_2$  211.1447

MS  $m/z$ , 211.1  $[\text{M}-\text{Br}]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(methoxyethoxycarbonylmethyl)imidazolium bromide (3a)**

The title compound was prepared from 1-methylimidazole (120 mmol, 9.84 g) and 2-methoxyethyl 2-bromoacetate (150 mmol, 29.55 g) according to the general procedure in 89 % yield (29.92 g, 107 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.33 (s, 1H), 7.57 (t,  $J = 1.8$  Hz, 1H), 7.41 (t,  $J = 1.8$  Hz, 1H), 5.56 (s, 2H), 4.39 (t,  $J = 4.6$  Hz, 2H), 4.10 (s, 3H), 3.66 (t,  $J = 4.6$  Hz, 2H), 3.40 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.18, 138.77, 123.73, 122.74, 69.84, 65.63, 59.03, 50.27, 36.94

MP ( $^\circ\text{C}$ ) 53 – 55

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3438, 3111, 3152, 1751, 1223, 1199, 1177, 1124, 1090, 1026

MS  $m/z$ , Found 199.1074  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_9\text{H}_{15}\text{N}_2\text{O}_3$  199.1083

MS  $m/z$ , 199.1  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium bromide (4a)**

The title compound was prepared from 1-methylimidazole (25.0 mmol, 2.05 g) and 2-ethoxyethyl 2-bromoacetate (30.0 mmol, 6.33 g) according to the general procedure in 93 % yield (6.81 g, 23.2 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.25 (s, 1H), 7.61 (t,  $J = 1.8$  Hz, 1H), 7.47 (t,  $J = 1.8$  Hz, 1H), 5.54 (s, 2H), 4.37 (t,  $J = 4.8$  Hz, 2H), 4.10 (s, 3H), 3.68 (t,  $J = 4.8$  Hz, 2H), 3.56 (q,  $J = 7.1$  Hz, 2H), 1.22 (t,  $J = 7.1$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.31, 138.35, 123.82, 123.04, 67.74, 66.70, 65.78, 50.31, 36.96, 15.11

MP ( $^\circ\text{C}$ ) 24 – 26

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3437, 3157, 3101, 1751, 1567, 1493, 1452, 1389, 1219, 1177, 1115, 1052

MS  $m/z$ , Found 213.1231  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{10}\text{H}_{17}\text{N}_2\text{O}_3$  213.1239

MS  $m/z$ , 213.1  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(propoxyethoxycarbonylmethyl)imidazolium bromide (5a)**

The title compound was prepared from 1-methylimidazole (65.0 mmol, 5.33 g) and 2-propoxyethyl 2-bromoacetate (78.0 mmol, 17.55 g) according to the general procedure in 88 % yield (17.59 g, 57.3 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.25 (s, 1H), 7.48 (t,  $J = 1.8$  Hz, 1H), 7.35 (t,  $J = 1.8$  Hz, 1H), 5.46 (s, 2H), 4.30 (t,  $J = 4.8$  Hz, 2H), 4.02 (s, 3H), 3.61 (t,  $J = 4.8$  Hz, 2H), 3.37 (t,  $J = 6.8$  Hz, 2H), 1.54 (tq,  $J = 6.8, 7.5$  Hz, 2H), 0.85 (t,  $J = 7.5$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.12, 138.74, 123.68, 122.77, 73.08, 67.89, 65.87, 50.28, 36.93, 22.75), 10.50

MP ( $^\circ\text{C}$ ) 25 – 27

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3099, 2967, 2927, 1751, 1578, 1568, 1558, 1539, 1495, 1452, 1216, 1176

MS  $m/z$ , Found 227.1410  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{11}\text{H}_{19}\text{N}_2\text{O}_3$  227.1396

MS  $m/z$ , 227.1  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### 3-Methyl-1-(butoxyethoxycarbonylmethyl)imidazolium bromide (6a)

The title compound was prepared from 1-methylimidazole (160 mmol, 13.12 g) and 2-butoxyethyl 2-bromoacetate (190 mmol, 45.41 g) according to the general procedure in 89 % yield (45.69 g, 142 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.19 (s, 1H), 7.60 (t,  $J = 1.8$  Hz, 1H), 7.48 (t,  $J = 1.8$  Hz, 1H), 5.52 (s, 2H), 4.36 (t,  $J = 4.6$  Hz, 2H), 4.10 (s, 3H), 3.67 (t,  $J = 4.6$  Hz, 2H), 3.47 (t,  $J = 6.8$  Hz, 2H), 1.59 (tt,  $J = 6.8, 6.8$  Hz, 2H), 1.40 (tq,  $J = 6.8, 7.3$  Hz, 2H), 0.92 (t,  $J = 7.3$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.16, 138.54, 123.74, 122.91, 71.24, 67.93, 65.82, 50.28, 36.94, 31.58, 19.22, 13.94

MP ( $^\circ\text{C}$ ) 28 – 30

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3094, 2957, 2933, 2866, 1751, 1575, 1569, 1558, 1539, 1495, 1452, 1216, 1177, 1120

MS  $m/z$ , Found 241.1539  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{12}\text{H}_{21}\text{N}_2\text{O}_3$  241.1552

MS  $m/z$ , 241.1  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### 3-Methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (7a)

The title compound was prepared from 1-methylimidazole (100 mmol, 8.20 g) and 2-methoxyethoxyethyl 2-bromoacetate (120 mmol, 28.92 g) according to the general procedure in 97 % yield (31.49 g, 97.5 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.21 (s, 1H), 7.53 (t,  $J = 1.7$  Hz, 1H), 7.31 (t,  $J = 1.7$  Hz, 1H), 5.47 (s, 2H), 4.32 (t,  $J = 4.6$  Hz, 2H), 4.02 (s, 3H), 3.68 (t,  $J = 4.6$  Hz, 2H), 3.59 (t,  $J = 4.8$  Hz, 2H), 3.50 (t,  $J = 4.8$  Hz, 2H), 3.31 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 164.38, 136.93, 122.06, 120.93, 70.00, 68.69, 66.75, 63.87, 57.24, 48.49, 35.13

MP ( $^\circ\text{C}$ ) 52 – 54  $^\circ\text{C}$

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3437, 3157, 3101, 2925, 1749, 1496, 1452, 1398, 1217, 1177, 1102, 1049

MS  $m/z$ , Found 243.1333  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{11}\text{H}_{19}\text{N}_2\text{O}_4$  243.1345

MS  $m/z$ , 243.1  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (8a)**

The title compound was prepared from 1-methylimidazole (59.0 mmol, 4.84 g) and 2-ethoxyethoxyethyl 2-bromoacetate (70.8 mmol, 18.05 g) according to the general procedure in 92 % yield (18.28 g, 54.2 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.09 (s, 1H), 7.61 (t,  $J = 1.8$  Hz, 1H), 7.41 (t,  $J = 1.8$  Hz, 1H), 5.46 (s, 2H), 4.31 (t,  $J = 4.6$  Hz, 2H), 4.02 (s, 3H), 3.68 (t,  $J = 4.6$  Hz, 2H), 3.59-3.57 (m, 2H), 3.53-3.51 (m, 2H), 3.49 (q,  $J = 7.1$  Hz, 2H), 1.13 (t,  $J = 7.1$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.24, 138.49, 123.93, 122.87, 70.65, 69.70, 68.55, 66.66, 65.64, 50.27, 36.92, 15.18

MP ( $^\circ\text{C}$ ) 28 – 30

IR (KBr disc) ( $\text{cm}^{-1}$ ) 2026, 2862, 1751, 1568, 1558, 1539, 1495, 1451, 1217, 1175

MS  $m/z$ , Found 257.1498  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{12}\text{H}_{21}\text{N}_2\text{O}_4$  257.1501

MS  $m/z$ , 257.1  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium bromide (9a)**

The title compound was prepared from 1-methylimidazole (50 mmol, 4.10 g) and 2-propoxyethoxyethyl 2-bromoacetate (60 mmol, 16.14 g) according to the general procedure in 98 % yield (17.16 g, 48.89 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.13 (s, 1H), 7.54, (t,  $J = 1.8$  Hz, 1H), 7.34 (t,  $J = 1.8$  Hz, 1H), 5.45 (s, 2H), 4.31 (t,  $J = 4.6$  Hz, 2H), 4.02 (s, 3H), 3.68 (t,  $J = 4.6$  Hz, 2H), 3.59-3.57 (m, 2H), 3.53-3.50 (m, 2H), 3.35 (t,  $J = 6.9$  Hz, 2H), 1.53 (tq,  $J = 6.9, 7.3$  Hz, 2H), 0.84 (t,  $J = 7.3$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.21, 138.54, 123.85, 122.84, 73.10, 70.62, 69.92, 68.55, 65.69, 50.29, 36.93, 22.76, 10.52

MP ( $^\circ\text{C}$ ) 32 – 34  $^\circ\text{C}$

IR (KBr disc) ( $\text{cm}^{-1}$ ) 2959, 2926, 2859, 1751, 1558, 1639, 1495, 1452

MS  $m/z$ , Found 271.1648  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{13}\text{H}_{23}\text{N}_2\text{O}_4$  271.1658

MS  $m/z$ , 271.2  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium bromide (10a)**

The title compound was prepared from 1-methylimidazole (220 mmol, 18.04 g) and 2-butoxyethoxyethyl 2-bromoacetate (260 mmol, 73.58 g) according to the general procedure in 94 % yield (75.65 g, 207 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.40 (s, 1H), 7.37 (t,  $J = 1.6$  Hz, 1H), 7.19 (t,  $J = 1.6$  Hz, 1H), 5.42 (s, 2H), 4.32 (t,  $J = 4.6$  Hz, 2H), 4.01 (s, 3H), 3.69 (t,  $J = 4.6$  Hz, 2H), 3.59-3.56 (m, 2H), 3.54-3.51 (m, 2H), 3.40 (t,  $J = 6.8$  Hz, 2H), 1.50 (tt,  $J = 6.8$  Hz, 7.2 Hz, 2H), 1.30 (tq,  $J = 7.2$  Hz, 7.3 Hz, 2H), 0.85 (t,  $J = 7.3$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.23, 138.35, 123.97, 123.03, 71.20, 70.60, 69.94, 68.54, 65.66, 50.27, 36.96, 31.62, 19.23, 13.94

MP ( $^\circ\text{C}$ ) 48 – 50  $^\circ\text{C}$

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3445, 2927, 2861, 1553, 1494, 1453, 1086, 1051

MS  $m/z$ , Found 285.1803  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{14}\text{H}_{25}\text{N}_2\text{O}_4$  285.1814

MS  $m/z$ , 285.2  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (11a)**

The title compound was prepared from 1-methylimidazole (90.0 mmol, 7.38 g) and 2-(2-(2-methoxyethoxy)ethoxy)ethyl 2-bromoacetate (91.0 mmol, 25.94 g) according to the general procedure in 55 % yield (18.30 g, 49.86 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.92 (s, 1H), 7.45 (t,  $J = 1.6$  Hz, 1H), 7.60 (t,  $J = 1.6$  Hz, 1H), 5.47 (s, 2H), 4.32 (t,  $J = 4.6$  Hz, 2H), 4.06 (s, 3H), 3.70 (t,  $J = 4.6$  Hz, 2H), 3.61-3.58 (m, 6H), 3.51-3.49 (m, 2H), 3.31 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.33, 138.18, 124.02, 123.15, 71.77, 70.43, 70.39, 70.33, 68.50, 65.44, 58.87, 50.20, 36.87

MP ( $^\circ\text{C}$ ) 59 – 61

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3150, 3095, 2925, 1751, 1635, 1575, 1569, 1558, 1494, 1451, 1216, 1176

MS  $m/z$ , Found 287.1605  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{13}\text{H}_{23}\text{N}_2\text{O}_5$  287.1607

MS  $m/z$ , 287.2  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(decoxy carbonylmethyl)imidazolium bromide (12a)**

The title compound was prepared from 1-methylimidazole (100 mmol, 8.20 g) and decyl 2-bromoacetate (110 mmol, 30.69 g) according to the general procedure in 51 % yield (18.47 g, 51.2 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.36 (s, 1H), 7.42 (t,  $J = 1.8$  Hz, 1H), 7.28 (t,  $J = 1.8$  Hz, 1H), 5.40 (s, 2H), 4.14 (t,  $J = 6.8$  Hz, 2H), 4.02 (s, 3H), 1.62-1.59 (m, 2H), 1.23-1.18 (m, 14H), 0.81 (t,  $J = 6.8$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.07, 138.93, 123.56, 122.64, 67.23, 50.28, 36.89, 31.89, 29.54, 29.48, 29.31, 29.19, 28.35, 25.73, 22.70, 14.15

MP ( $^\circ\text{C}$ ) 49 – 51  $^\circ\text{C}$

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3426, 2961, 1919, 2853, 1748, 1232, 1178, 1052

MS  $m/z$ , Found 281.2228  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{16}\text{H}_{29}\text{N}_2\text{O}_2$  281.2229

MS  $m/z$ , 281.2  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **2,3-Dimethyl-1-(butoxyethoxycarbonylmethyl)imidazolium bromide (13a)**

The title compound was prepared from 1,2-dimethylimidazole (9.00 mmol, 0.86 g) and 2-butoxyethyl 2-bromoacetate (11.0 mmol, 2.63 g) according to the general procedure in 92 % yield (2.78 g, 8.30 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 7.81 (d,  $J = 2.4$  Hz, 1H), 7.53 (d,  $J = 2.4$  Hz, 1H), 5.42 (s, 2H), 4.30 (t,  $J = 4.6$  Hz, 2H), 3.89 (s, 3H), 3.61 (t,  $J = 4.6$  Hz, 2H), 3.47 (t,  $J = 6.7$  Hz, 2H), 2.56 (s, 3H), 1.56 (tt,  $J = 6.7, 7.2$  Hz, 2H), 1.36 (tq,  $J = 7.2, 7.5$  Hz, 2H), 0.93 (t,  $J = 7.5$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.30, 145.78, 123.02, 122.34, 71.24, 67.98, 65.69, 50.02, 36.04, 31.62, 19.04, 13.96, 11.27

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2957, 2933, 2866, 1751, 1593, 1558, 1546, 1495, 1451, 1216, 1120

MS  $m/z$ , Found 255.1689  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{13}\text{H}_{23}\text{N}_2\text{O}_3$  255.1709

MS  $m/z$ , 255.2  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **2,3-Dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (14a)**

The title compound was prepared from 1,2-dimethylimidazole (150 mmol, 14.40 g) and 2-(2-methoxyethoxy) ethyl 2-bromoacetate (171 mmol, 41.21 g) according to the general procedure in 88 % yield (44.48 g, 132 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 7.69 (d,  $J = 2.0$  Hz, 1H), 7.34 (d,  $J = 2.0$  Hz, 1H), 5.40 (s, 2H), 4.32 (t,  $J = 4.7$  Hz, 2H), 3.86 (s, 3H), 3.68 (t,  $J = 4.7$  Hz, 2H), 3.59 (t,  $J = 4.4$  Hz, 2H), 3.49 (t,  $J = 4.4$  Hz, 2H), 3.31 (s, 3H), 2.71 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.34, 145.77, 123.04, 122.38, 71.79, 70.47, 68.55, 65.51, 59.02, 49.96, 35.98, 11.25

MP ( $^\circ\text{C}$ ) 74 – 75

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3426, 2925, 2868, 1747, 1453, 1248, 1214, 1135, 1099, 1026

MS  $m/z$ , Found 257.1492  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{12}\text{H}_{21}\text{N}_2\text{O}_4$  257.1501

MS  $m/z$ , 257.1  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **2,3-Dimethyl-1-(pentoxycarbonylmethyl)imidazolium bromide (15a)**



The title compound was prepared from 1,2-dimethylimidazole (150 mmol, 14.40 g) and pentyl 2-bromoacetate (168 mmol, 35.11 g) according to the general procedure in 81 % yield (36.91 g, 121 mmol)

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 7.74 (d,  $J = 2.0$  Hz, 1H), 7.46 (d,  $J = 2.0$  Hz, 1H), 5.38 (s, 2H), 4.13 (t,  $J = 6.8$  Hz, 2H), 3.89 (s, 3H), 2.69 (s, 3H), 1.63-1.54 (m, 2H), 1.27-1.20 (m, 4H), 0.85 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.31, 145.81, 122.98, 122.22, 67.08, 50.12, 36.03, 28.06, 27.83, 22.24, 13.95, 11.35

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2957, 2928, 2858, 1751, 1558, 1545, 1539, 1495, 1452, 1238, 1210, 1176

MS  $m/z$ , Found 225.1594  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{12}\text{H}_{21}\text{N}_2\text{O}_2$  225.1603

MS  $m/z$ , 225.2  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### NTf<sub>2</sub> salts

#### **3-Methyl-1-(butoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (1b)**

The title compound was prepared from 3-methyl-1-(butoxycarbonylmethyl)imidazolium bromide (**1a**) (3.05 g, 11.0 mmol) and LiNTf<sub>2</sub> (4.89 g, 17.0 mmol) according to the general procedure in 86 % yield (4.49 g, 9.41 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.78 (s, 1H), 7.30 (t,  $J = 1.8$  Hz, 1H), 7.24 (t,  $J = 1.8$  Hz, 1H), 4.95 (s, 2H), 4.15 (t,  $J = 6.7$  Hz, 2H), 3.89 (s, 3H), 1.59 (tt,  $J = 6.7, 7.4$  Hz, 2H), 1.31 (tq,  $J = 7.4, 7.2$  Hz, 2H), 0.87 (t,  $J = 7.2$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.75, 137.69, 123.79, 123.16), 122.03 (q,  $J = 320$  Hz,  $2\text{CF}_3$ 's), 66.97, 49.93, 36.56, 30.03, 18.87, 13.55

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3164, 3125, 2966, 2937, 2876, 1750, 1580, 1569, 1559, 1495, 1457, 1354, 1197, 1136

MS  $m/z$ , 197.1  $[\text{M}-\text{NTf}_2^-]^+$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^-]$

#### **3-Methyl-1-(pentoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (2b)**

The title compound was prepared from 3-methyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**2a**) (19.15 g, 39.0 mmol) and LiNTf<sub>2</sub> (13.49 g, 47.0 mmol) according to the general procedure in 93 % yield (17.78 g, 36.2 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 8.67 (s, 1H), 7.32 (t, *J* = 1.6 Hz, 1H), 7.27 (t, *J* = 1.6 Hz, 1H), 4.91 (s, 2H), 4.11 (t, *J* = 6.8 Hz, 2H), 3.85 (s, 3H), 1.65-1.57 (m, 2H), 1.24-1.23 (m, 4H), 0.82 (t, *J* = 6.8 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.76, 137.52, 123.85, 123.25, 122.20 (q, *J* = 319 Hz, 2CF<sub>3</sub>'s), 67.20, 49.88, 36.48, 27.91, 27.73, 22.18, 13.82

IR (thin film on salt plate) (cm<sup>-1</sup>) 3164, 3124, 2963, 2928, 2862, 1750, 1582, 1569, 1558, 1495, 1455, 1354, 1197, 1136

MS *m/z*, 211.2 [M-NTf<sub>2</sub>]<sup>+</sup>; MS: *m/z*, 280.0 [NTf<sub>2</sub>]<sup>-</sup>

### **3-Methyl-1-(methoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (3b)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyoxycarbonylmethyl)imidazolium bromide (**3a**) (1.74 g, 6.26 mmol) and LiNTf<sub>2</sub> (2.16 g, 7.51 mmol) according to the general procedure in 91 % yield (2.73 g, 5.70 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 8.85 (s, 1H), 7.39 (t, *J* = 1.8 Hz, 1H), 7.33 (t, *J* = 1.8 Hz, 1H), 5.07 (s, 2H), 4.40 (t, *J* = 4.6 Hz, 2H), 3.98 (s, 3H), 3.66 (t, *J* = 4.6 Hz, 2H), 3.40 (s, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.73, 137.75, 123.78, 123.18, 119.70 (q, *J* = 319 Hz, 2CF<sub>3</sub>'s), 69.75, 65.72, 63.24, 58.89, 49.93

IR (thin film on salt plate) (cm<sup>-1</sup>) 2926, 2855, 1750, 1636, 1558, 1539, 1495, 1452, 1365, 1204, 1129

MS *m/z*, 199.1 [M-NTf<sub>2</sub>]<sup>+</sup>; MS: *m/z*, 280.0 [NTf<sub>2</sub>]<sup>-</sup>

### **3-Methyl-1-(ethoxyethoxyoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (4b)**

The title compound was prepared from 3-methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium bromide (**4a**) (2.93 g, 10.0 mmol) and LiNTf<sub>2</sub> (4.59 g, 16.0 mmol) according to the general procedure in 90 % yield (4.42 g, 8.97 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.82 (s, 1H), 7.39 (t,  $J = 1.8$  Hz, 1H), 7.34 (t,  $J = 1.8$  Hz, 1H), 5.06 (s, 2H), 4.38 (t,  $J = 4.6$  Hz, 2H), 3.97 (s, 3H), 3.68 (t,  $J = 4.6$  Hz, 2H), 3.56 (q,  $J = 7.1$  Hz, 2H), 1.22 (t,  $J = 7.1$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.76, 137.63, 123.80, 123.25, 119.70 (q,  $J = 319$  Hz,  $2\text{CF}_3$ 's), 67.62, 66.67, 65.97, 49.92, 36.56, 15.01

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3169, 3116, 2967, 2927, 2859, 1751, 1581, 1569, 1558, 1495, 1452, 1352, 1196, 1135

MS  $m/z$ , 213.1  $[\text{M-NTf}_2]^{+}$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^{-}]$

### **3-Methyl-1-(propoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (5b)**

The title compound was prepared from 3-methyl-1-(propoxyethoxycarbonylmethyl)imidazolium bromide (**5a**) (3.55 g, 7.00 mmol) and  $\text{LiNTf}_2$  (2.15 g, 7.50 mmol) according to the general procedure in 68 % yield (2.43 g, 4.79 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.78 (s, 1H), 7.39 (t,  $J = 1.8$  Hz, 1H), 7.36 (t,  $J = 1.8$  Hz, 1H), 5.04 (s, 2H), 4.37 (t,  $J = 4.8$  Hz, 2H), 3.95 (s, 3H), 3.67 (t,  $J = 4.8$  Hz, 2H), 3.43 (t,  $J = 6.7$  Hz, 2H), 1.61 (tq,  $J = 6.7, 7.3$  Hz, 2H), 0.92 (t,  $J = 7.3$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.76, 137.50, 123.82, 123.34, 119.09 (q,  $J = 319$  Hz,  $2\text{CF}_3$ 's), 72.99, 67.79, 65.91, 49.87, 56.49, 22.68, 10.37

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3164, 3117, 2968, 2927, 2862, 1751, 1569, 1558, 1539, 1495, 1452, 1353, 1198, 1135

MS  $m/z$ , 227.2  $[\text{M-NTf}_2]^{+}$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^{-}]$

### **3-Methyl-1-(butoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (6b)**

The title compound was prepared from 3-methyl-1-(butoxyethoxycarbonylmethyl)imidazolium bromide (**6a**) (1.85 g, 5.77 mmol) and  $\text{LiNTf}_2$  (1.99 g, 6.92 mmol) according to the general procedure in 84 % yield (2.73 g, 4.82 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.71 (s, 1H), 7.38 (t,  $J = 1.8$  Hz, 1H), 7.36 (t,  $J = 1.8$  Hz, 1H), 5.00 (s, 2H), 4.32 (t,  $J = 4.8$  Hz, 2H), 3.91 (s, 3H), 3.64 (t,  $J = 4.8$  Hz, 2H),

3.44 (t,  $J = 6.7$  Hz, 2H), 1.54 (tt,  $J = 6.7, 7.2$  Hz, 2H), 1.34 (tq,  $J = 7.2, 7.5$  Hz, 2H), 0.89 (t,  $J = 7.5$  Hz, 3 H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.78, 137.32, 123.83, 123.40, 122.33 (q,  $J = 319$  Hz,  $2\text{CF}_3$ 's), 71.09, 67.78, 65.81, 49.78, 36.37, 31.50, 19.11, 13.78

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3164, 3123, 2959, 2934, 2864, 1756, 1582, 1569, 1558, 1495, 1453, 1354, 1197, 1135

MS  $m/z$ , 241.2  $[\text{M}-\text{NTf}_2]^+$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^-]$

### **3-Methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (7b)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**7a**) (1.01 g, 3.13 mmol) and  $\text{LiNTf}_2$  (1.09 g, 3.80 mmol) according to the general procedure in 91 % yield (1.49 g, 2.85 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.80 (s, 1H), 7.42 (t,  $J = 1.8$  Hz, 1H), 7.36 (t,  $J = 1.8$  Hz, 1H), 5.05 (s, 2H), 4.38 (t,  $J = 4.7$  Hz, 2H), 3.96 (s, 3H), 3.74 (t,  $J = 4.7$  Hz, 2H), 3.65-3.60 (m, 2H), 3.56-3.53 (m, 2H), 3.37 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.81, 137.55, 123.89, 123.28, 119.15 (q,  $J = 319$  Hz,  $2\text{CF}_3$ 's), 71.69, 70.35, 68.38, 65.65, 58.88, 49.86, 36.48

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3162, 3123, 2962, 2926, 2861, 1751, 1580, 1569, 1558, 1495, 1452, 1354, 1198, 1136

MS  $m/z$ , 243.2  $[\text{M}-\text{NTf}_2]^+$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^-]$

### **3-Methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (8b)**

The title compound was prepared from 3-methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**8a**) (1.88 g, 5.59 mmol) and  $\text{LiNTf}_2$  (1.92 g, 6.70 mmol) according to the general procedure in 87 % yield (2.61g, 4.86 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.82 (s, 1H), 7.42 (t,  $J = 1.8$  Hz, 1H), 7.35 (t,  $J = 1.8$  Hz, 1H), 5.05 (s, 2H), 4.38 (t,  $J = 4.8$  Hz, 2H), 3.97 (s, 3H), 3.74 (t,  $J = 4.8$  Hz, 2H), 3.66 (t,  $J = 4.4$  Hz, 2H), 3.61 (t,  $J = 4.4$  Hz, 2H), 3.58 (q,  $J = 7.0$  Hz, 2H), 1.21 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.79, 137.59, 123.90, 123.27, 119.69 (q,  $J = 319$  Hz,  $2\text{CF}_3$ 's), 70.56, 69.61, 68.40, 66.62, 65.71, 49.89, 36.52, 15.09

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3162, 3123, 2969, 2926, 2865, 1752, 1582, 1558, 1495, 1452, 1354, 1197, 1135

MS  $m/z$ , 257.2  $[\text{M-NTf}_2]^{+}$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^{-}]$

### **3-Methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (9b)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**9a**) (1.91 g, 5.45 mmol) and  $\text{LiNTf}_2$  (1.88 g, 6.54 mmol) according to the general procedure in 82 % yield (2.46 g, 4.46 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.92 (s, 1H), 7.40 (t,  $J = 1.7$  Hz, 1H), 7.31 (t,  $J = 1.7$  Hz, 1H), 5.08 (s, 2H), 4.41 (t,  $J = 4.8$  Hz, 2H), 4.00 (s, 3H), 3.77 (t,  $J = 4.8$  Hz, 2H), 3.67 (t,  $J = 4.8$ , 2H), 3.61 (t,  $J = 4.8$  Hz, 2H), 3.44 (t,  $J = 6.8$  Hz, 2H), 1.61 (tt,  $J = 6.8$ , 7.2 Hz, 2H), 0.93 (t,  $J = 7.2$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.71, 137.92, 123.80, 123.07, 122.00 (q,  $J = 319$  Hz,  $2\text{CF}_3$ 's), 73.09, 70.58, 69.89, 68.42, 65.86, 50.02, 36.66, 22.76, 10.47

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3164, 3119, 2966, 2927, 2865, 1751, 1568, 1558, 1495, 1452, 1353, 1198, 1135

MS  $m/z$ , 271.3  $[\text{M-NTf}_2]^{+}$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^{-}]$

### **3-Methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (10b)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**10a**) (2.34 g, 6.4 mmol) and  $\text{LiNTf}_2$  (2.20 g, 7.68 mmol) according to the general procedure in 86 % yield (3.10 g, 5.48 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.73 (s, 1H), 7.34 (t,  $J = 1.6$  Hz, 1H), 7.27 (t,  $J = 1.6$  Hz, 1H), 4.96 (s, 2H), 4.31 (t,  $J = 4.8$  Hz, 2H), 3.88 (s, 3H), 3.67 (t,  $J = 4.8$  Hz, 2H), 3.56-3.55 (m, 2H), 3.52-3.49 (m, 2H), 3.40 (t,  $J = 6.8$  Hz, 2H), 1.51 (tt,  $J = 6.8$ , 7.2 Hz, 2H), 1.33 (tt,  $J = 7.2$ , 7.3 Hz, 2H), 0.86 (t,  $J = 7.4$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.74, 137.60, 123.88, 123.28, 119.71 (q,  $J = 319$  Hz,  $2\text{CF}_3$ 's), 71.17, 70.54, 69.90, 68.39, 65.75, 49.90, 36.52, 31.62, 19.95, 13.87

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3163, 3123, 2957, 2934, 2868, 1756, 1569, 1558, 1539, 1495, 1455, 1354, 1197, 1135

MS  $m/z$ , 285.3  $[\text{M-NTf}_2]^+$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^-]$

### **3-Methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (11b)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**11a**) (2.20 g, 6.00 mmol) and LiNTf<sub>2</sub> (2.01 g, 7.00 mmol) according to the general procedure in 93 % yield (3.17 g, 5.60 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 8.78 (s, 1H), 7.37 (t,  $J = 1.6$  Hz, 1H), 7.26 (t,  $J = 1.6$  Hz, 1H), 4.99 (s, 2H), 4.31 (t,  $J = 4.6$  Hz, 2H), 3.89 (s, 3H), 3.66 (t,  $J = 4.6$  Hz, 2H), 3.57-3.54 (m, 6H), 3.49-3.47 (m, 2H), 3.28 (s, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 165.78, 137.75, 123.96, 123.18, 119.7 (q,  $J = 319$  Hz, 2CF<sub>3</sub>'s), 71.79, 70.42, 70.38, 70.32, 68.35, 65.57, 58.82, 49.92, 36.53

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3161, 3116, 2925, 2859, 1751, 1569, 1558, 1539, 1495, 1452, 1354, 1198, 1135

MS  $m/z$ , 287.2  $[\text{M-NTf}_2]^+$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^-]$

### **3-Methyl-1-(decoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (12b)**

The title compound was prepared from 3-methyl-1-(decoxycarbonylmethyl)imidazolium bromide (**12a**) (3.03 g, 8.40 mmol) and LiNTf<sub>2</sub> (2.73 g, 9.5 mmol) according to the general procedure in 95 % (4.46 g, 7.94 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 8.76 (s, 1H), 7.30 (t,  $J = 1.6$  Hz, 1H), 7.24 (t,  $J = 1.6$  Hz, 1H), 4.94 (s, 2H), 4.16 (t,  $J = 7.0$  Hz, 2H), 3.89 (s, 3H), 1.63-1.55 (m, 2H), 1.24-1.95 (m, 14H), 0.83 (t,  $J = 6.8$  Hz, 3H).

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 165.75, 137.54, 123.83, 123.26, 119.71 (q,  $J = 319$  Hz, 2CF<sub>3</sub>'s), 67.24, 49.89, 36.49, 29.62, 29.56, 29.51, 29.44, 29.29, 28.24, 25.74, 22.67, 14.10

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3171, 3120, 2957, 2926, 2859, 1751, 1558, 1539, 1497, 1452, 1354, 1198, 1134

MS  $m/z$ , 281.3  $[\text{M-NTf}_2]^+$ ; MS:  $m/z$ , 280.0  $[\text{NTf}_2^-]$

### **2,3-Dimethyl-1-(butoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (13b)**

The title compound was prepared from 2,3-dimethyl-1-(butoxycarbonylmethyl)imidazolium bromide (**13a**) (3.69 g, 11.0 mmol) and LiNTf<sub>2</sub> (4.59 g, 16.0 mmol) according to the general procedure in 83 % yield (4.88 g, 9.12 mmol). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 7.26 (dd, *J* = 1.8, 1.8 Hz, 2H), 4.95 (s, 2H), 4.37 (t, *J* = 4.6 Hz, 2H), 3.83 (s, 3H), 3.67 (t, *J* = 4.6 Hz, 2H), 3.48 (t, *J* = 6.7 Hz, 2H), 1.57 (tt, *J* = 6.7, 7.2 Hz, 2H), 1.36 (tq, *J* = 7.2, 7.5 Hz, 2H), 0.93 (t, *J* = 7.5 Hz, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.72, 145.53, 122.39, 122.36, 119.7 (q, *J* = 320 Hz, 2CF<sub>3</sub>'s), 71.16, 67.83, 65.87, 49.16, 35.50, 31.56, 19.18, 13.86, 9.74. IR (thin film on salt plate) (cm<sup>-1</sup>) 3151, 2962, 2934, 2865, 1751, 1595, 1558, 1539, 1495, 1452, 1352, 1198, 1136. MS *m/z*, 255.2 [M-NTf<sub>2</sub>]<sup>+</sup>; MS: *m/z*, 280.0 [NTf<sub>2</sub>]<sup>-</sup>

### **2,3-Dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (14b)**

The title compound was prepared from 2,3-dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**14a**) (2.70 g, 8.00 mmol) and LiNTf<sub>2</sub> (2.44 g, 8.50 mmol) according to the general procedure in 96 % yield (4.12 g, 7.67 mmol). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 7.29 (d, *J* = 2.2 Hz, 1H), 7.26 (d, *J* = 2.2 Hz, 1H), 4.96 (s, 2H), 4.39 (t, *J* = 4.8 Hz, 2H), 3.82 (s, 3H), 3.74 (t, *J* = 4.8 Hz, 2H), 3.65-3.63 (m, 2H), 3.56-3.54 (m, 2H), 3.37 (s, 3H), 2.56 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.76, 145.61, 122.42, 122.35, 119.70 (q, *J* = 319 Hz, 2CF<sub>3</sub>'s), 71.72, 70.39, 68.38, 65.71, 58.97, 49.20, 35.53, 9.79. IR (thin film on salt plate) (cm<sup>-1</sup>) 3150, 2962, 2857, 1751, 1558, 1539, 1495, 1452, 1354, 1198, 1136. MS *m/z*, 257.2 [M-NTf<sub>2</sub>]<sup>+</sup>; MS: *m/z*, 280.0 [NTf<sub>2</sub>]<sup>-</sup>

### **2,3-Dimethyl-1-(pentoxycarbonylmethyl)imidazolium NTf<sub>2</sub> (15b)**

The title compound was prepared from 2,3-dimethyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**15a**) (3.36 g, 11.0 mmol) and LiNTf<sub>2</sub> (4.59 g, 16.0 mmol) according to the general procedure in 95 % yield (5.30 g, 10.5 mmol).  
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 7.28 (d, *J* = 2.2 Hz, 1H), 7.26 (d, *J* = 2.2 Hz, 1H), 4.93 (s, 2H), 4.21 (t, *J* = 6.8 Hz, 2H), 3.82 (s, 3H), 2.56 (s, 3H), 1.68-1.60 (m, 2H), 1.34-1.27 (m, 4H), 0.92 (t, *J* = 7.0 Hz, 3H)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.78, 145.45, 122.38, 122.37, 119.7 (q, *J* = 321 Hz, 2CF<sub>3</sub>'s), 67.21, 49.17, 35.48, 27.93, 27.75, 22.18, 13.85, 9.75  
IR (thin film on salt plate) (cm<sup>-1</sup>) 3154, 2962, 2930, 2862, 1751, 1595, 1558, 1546, 1539, 1495, 1452, 1354, 1197, 1137  
MS *m/z*, 225.2 [M-NTf<sub>2</sub>]<sup>+</sup>; MS: *m/z*, 280.0 [NTf<sub>2</sub>]<sup>-</sup>



## **BF<sub>4</sub> salts**

### **3-Methyl-1-(butoxycarbonylmethyl)imidazolium BF<sub>4</sub> (1c)**

The title compound was prepared from 3-methyl-1-(butoxycarbonylmethyl)imidazolium bromide (**1a**) (2.94 g, 10.6 mmol) and NaBF<sub>4</sub> (1.40 g, 12.7 mmol) according to the general procedure in 97 % yield (2.92 g, 10.28 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 8.94 (s, 1H), 7.66 (t, *J* = 1.6 Hz, 1H), 7.63 (t, *J* = 1.6 Hz, 1H), 5.23 (s, 2H), 4.10 (t, *J* = 6.6 Hz, 2H), 3.98 (s, 3H), 1.54 (tt, *J* = 6.6, 7.2 Hz, 2H), 1.30 (tq, *J* = 7.2, 7.4 Hz, 2H), 0.80 (t, *J* = 7.4 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.50, 138.91, 124.93, 124.50, 66.64, 50.63, 36.84, 31.20, 19.60, 13.92

IR (thin film on salt plate) (cm<sup>-1</sup>) 3167, 3126, 2964, 2932, 2972, 1750, 1582, 1569, 1558, 1495, 1455, 1398, 1217, 1181

MS *m/z*, 197.1 [M-BF<sub>4</sub>]<sup>+</sup>; MS: *m/z*, 87.0 [BF<sub>4</sub>]<sup>-</sup>

### **3-Methyl-1-(pentoxycarbonylmethyl)imidazolium BF<sub>4</sub> (2c)**

The title compound was prepared from 3-methyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**2a**) (3.11 g, 10.1 mmol) and NaBF<sub>4</sub> (1.33 g, 12.1 mmol) according to the general procedure in 95 % yield (2.86 g, 9.60 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.08 (s, 1H), 7.45 (t, *J* = 1.8 Hz, 1H), 7.39 (s, *J* = 1.8 Hz, 1H), 5.14 (s, 2H), 4.22 (t, *J* = 6.8 Hz, 2H), 3.97 (s, 3H), 1.72 (tt, *J* = 6.8, 7.1 Hz, 2H), 1.38-1.27 (m, 4H), 0.93 (t, *J* = 7.1 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 166.24, 137.73, 123.73, 123.27, 66.99, 49.86, 36.37, 27.97, 27.76, 22.22, 13.98

IR (thin film on salt plate) (cm<sup>-1</sup>) 3167, 3124, 2961, 2931, 2860, 1750, 1582, 1569, 1559, 1495, 1455, 1398, 1230, 1178

MS *m/z*, 211.2 [M-BF<sub>4</sub>]<sup>+</sup>; MS: *m/z*, 87.0 [BF<sub>4</sub>]<sup>-</sup>

### **3-Methyl-1-(methoxyethoxycarbonylmethyl)imidazolium BF<sub>4</sub> (3c)**

The title compound was prepared from 3-methyl-1-(methoxyethoxycarbonylmethyl)imidazolium bromide (**3a**) (2.93 g, 10.5 mmol) and NaBF<sub>4</sub> (1.39 g, 12.6 mmol) according to the general procedure in 95 % yield (2.86 g, 10.0 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 8.71 (s, 1H), 7.43 (s, 2H), 5.11 (s, 2H), 4.33 (t, *J* = 4.4 Hz, 2H), 3.85 (s, 3H), 3.66 (t, *J* = 4.4 Hz, 2H), 3.31 (s, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 170.52, 139.95, 126.08, 125.99, 67.81, 60.59, 52.22, 38.42, 32.74

IR (thin film on salt plate) (cm<sup>-1</sup>) 3167, 3123, 2961, 2927, 1751, 1583, 1569, 1558, 1495, 1452, 1382, 1226, 1181

MS *m/z*, 199.1 [M-BF<sub>4</sub>]<sup>+</sup>; MS: *m/z*, 87.0 [BF<sub>4</sub>]<sup>-</sup>

### **3-Methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium BF<sub>4</sub> (4c)**

The title compound was prepared from 3-Methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium bromide (**4a**) (2.93 g, 10.0 mmol) and NaBF<sub>4</sub> (1.32 g, 12.0 mmol) according to the general procedure in 96 % yield (2.87 g, 9.57 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 8.69 (s, 1H), 7.35 (t, *J* = 1.8 Hz, 1H), 7.32 (t, *J* = 1.8 Hz, 1H), 4.99 (s, 2H), 4.27 (t, *J* = 4.6 Hz, 2H), 3.84 (s, 3H), 3.60 (t, *J* = 4.6 Hz, 2H), 3.48 (q, *J* = 6.9 Hz, 2H), 1.13 (t, *J* = 6.9 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 166.36, 137.70, 123.75, 123.33, 67.72, 66.59, 65.76, 49.76, 36.37, 15.07

IR (thin film on salt plate) (cm<sup>-1</sup>) 3167, 3119, 2977, 2937, 2865, 1751, 1582, 1569, 1558, 1495, 1451, 1227, 1217, 1180

MS *m/z*, 213.1 [M-BF<sub>4</sub>]<sup>+</sup>; MS: *m/z*, 87.0 [BF<sub>4</sub>]<sup>-</sup>

### **3-Methyl-1-(propoxyethoxycarbonylmethyl)imidazolium BF<sub>4</sub> (5c)**

The title compound was prepared from 3-methyl-1-(propoxyethoxycarbonylmethyl)imidazolium bromide (**5a**) (2.93 g, 9.56 mmol) and NaBF<sub>4</sub> (1.26g, 11.5 mmol) according to the general procedure in 97 % yield (2.92 g, 9.30 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.94 (s, 1H), 7.66 (t,  $J = 1.8$  Hz, 1H), 7.64 (t,  $J = 1.8$  Hz, 1H), 5.24 (s, 2H), 4.21 (t,  $J = 4.7$  Hz, 2H), 3.98 (s, 3H), 3.53 (t,  $J = 4.7$  Hz, 2H), 3.28 (t,  $J = 6.5$  Hz, 2H), 1.46 (tq,  $J = 6.5, 7.5$  Hz, 2H), 0.77 (t,  $J = 7.5$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.52, 138.92, 123.93, 124.52, 73.23, 68.74, 66.27, 50.62, 36.86, 23.54, 10.83

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3167, 3124, 2966, 2930, 2876, 1751, 1581, 1569, 1558, 1495, 1452, 1394, 1224, 1181

MS  $m/z$ , 227.2  $[\text{M-BF}_4]^{+}$ ; MS:  $m/z$ , 87.0  $[\text{BF}_4]^{-}$

### **3-Methyl-1-(butoxyethoxycarbonylmethyl)imidazolium $\text{BF}_4$ (6c)**

The title compound was prepared from 3-methyl-1-(butoxyethoxycarbonylmethyl)imidazolium bromide (**6a**) (2.94 g, 9.15 mmol) and  $\text{NaBF}_4$  (1.21g, 11.0 mmol) according to the general procedure in 96 % yield (2.88 g, 8.78 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.83 (s, 1H), 7.42 (t,  $J = 1.8$  Hz, 1H), 7.39 (t,  $J = 1.8$  Hz, 1H), 5.08 (s, 2H), 4.36 (t,  $J = 4.7$  Hz, 2H), 3.94 (s, 3H), 3.68 (t,  $J = 4.7$  Hz, 2H), 3.49 (t,  $J = 6.8$  Hz, 2H), 1.59 (tt,  $J = 6.8, 7.2$  Hz, 2H), 1.41 (tq,  $J = 7.2, 7.4$  Hz, 2H), 0.94 (t,  $J = 7.4$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.28, 137.78, 123.70, 123.29, 71.15, 67.94, 65.74, 49.81, 36.41, 31.58, 19.20, 13.90

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3167, 3126, 2961, 2935, 1750, 1582, 1569, 1558, 1495, 1456, 1451, 1218, 1181

MS  $m/z$ , 241.2  $[\text{M-BF}_4]^{+}$ ; MS:  $m/z$ , 87.0  $[\text{BF}_4]^{-}$

### **3-Methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium $\text{BF}_4$ (7c)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**7a**) (2.95g, 9.12 mmol) and  $\text{NaBF}_4$  (1.20 10.9 mmol) according to the general procedure in 94 % yield (2.84g, 8.61 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.71 (s, 1H), 7.38 (d,  $J = 1.6$  Hz, 1H) 7.34 (d,  $J = 1.6$  Hz, 1H), 4.99 (s, 2H), 4.77 (t,  $J = 4.6$  Hz, 2H), 3.86 (s, 3H), 3.66 (t,  $J = 4.6$  Hz, 2H), 3.57 (t,  $J = 4.4$  Hz, 2H), 3.48 (t,  $J = 4.4$  Hz, 2H), 3.28 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.46, 137.67, 123.82, 123.36, 71.69, 70.26, 68.49, 65.50, 58.81, 49.69, 36.31

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3166, 3123, 1750, 1581, 1575, 1569, 1558, 1495, 1451, 1221, 1181

MS  $m/z$ , 243.2  $[\text{M}-\text{BF}_4]^{+}$ ; MS:  $m/z$ , 87.0  $[\text{BF}_4]^{-}$

### **3-Methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium $\text{BF}_4$ (8c)**

The title compound was prepared from 3-methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**8a**) (2.94 g, 8.73 mmol) and  $\text{NaBF}_4$  (1.15g, 10.48 mmol) according to the general procedure in 96 % yield (2.89 g, 8.40 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.94 (s, 1H), 7.66 (t,  $J = 1.8$  Hz, 1H), 7.63 (t,  $J = 1.8$  Hz, 1H), 5.23 (s, 2H), 4.21 (t,  $J = 4.7$  Hz, 2H), 3.98 (s, 3H), 3.59 (t,  $J = 4.7$  Hz, 2H), 3.48-3.45 (m, 2H), 3.41-3.39 (m, 2H), 3.36 (q,  $J = 7.0$  Hz, 2H), 1.02 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.54, 138.92, 124.94, 124.51, 71.22, 70.56, 69.22, 66.83, 66.27, 50.63, 46.85, 15.59

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3167, 3121, 2970, 2926, 2862, 1756, 1582, 1569, 1558, 1495, 1451, 1218, 1181

MS  $m/z$ , 257.2  $[\text{M}-\text{BF}_4]^{+}$ ; MS:  $m/z$ , 87.0  $[\text{BF}_4]^{-}$

### **3-Methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium $\text{BF}_4$ (9c)**

The title compound was prepared from 3-methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**9a**) (2.94 g, 8.38 mmol) and  $\text{NaBF}_4$  (1.11g, 10.1 mmol) according to the general procedure in 93 % yield (2.79 g, 7.79 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.95 (s, 1H), 7.45 (t,  $J = 1.8$  Hz, 1H), 7.37 (t,  $J = 1.8$  Hz, 1H), 5.12 (s, 2H), 4.38 (t,  $J = 4.7$  Hz, 2H), 3.97 (s, 3H), 3.75 (t,  $J = 4.7$  Hz, 2H), 3.67 (t,  $J = 3.2$  Hz, 2H), 3.60 (t,  $J = 3.2$  Hz, 2H), 3.44 (t,  $J = 6.8$  Hz, 2H), 1.64 (tq,  $J = 6.8$ , 7.6 Hz, 2H), 0.94 (t,  $J = 7.6$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.23, 137.96, 123.79, 123.13, 73.06, 70.54, 69.89, 68.54, 65.66, 49.85, 36.52, 22.75, 10.49

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3166, 3121, 2964, 2927, 2866, 1750, 1581, 1574, 1569, 1558, 1495, 1452, 1220, 1181

MS  $m/z$ , 271.3  $[\text{M-BF}_4]^{+}$ ; MS:  $m/z$ , 87.0  $[\text{BF}_4^{-}]$

### **3-Methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium $\text{BF}_4$ (10c)**

The title compound was prepared from 3-methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**10a**) (2.94 g, 8.06 mmol) and  $\text{NaBF}_4$  (1.06g, 9.68 mmol) according to the general procedure in 92 % yield (2.79 g, 7.50 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.09 (s, 1H), 7.80 (t,  $J = 1.8$  Hz, 1H), 7.77 (t,  $J = 1.8$  Hz, 1H), 5.38 (s, 2H), 4.35 (t,  $J = 4.7$  Hz, 2H), 4.11 (s, 3H), 3.74 (t,  $J = 4.7$  Hz, 2H), 3.62-3.59 (m, 2H), 3.56-3.53 (m, 2H), 3.46 (t,  $J = 6.4$  Hz, 2H), 1.54 (tt,  $J = 6.4, 6.8$  Hz, 2H), 1.39 (tq,  $J = 6.8, 7.2$  Hz, 2H), 0.92 (t,  $J = 7.2$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.39, 166.33, 137.74, 123.78, 123.30, 72.48, 71.05, 70.18, 68.53, 61.86, 49.74, 30.96, 19.23, 13.92

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3167, 3120, 2956, 2930, 2863, 1751, 1581, 1569, 1558, 1495, 1455, 1217, 1181

MS  $m/z$ , 285.3  $[\text{M-BF}_4]^{+}$ ; MS:  $m/z$ , 87.0  $[\text{BF}_4^{-}]$

### **3-Methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium $\text{BF}_4$ (11c)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**11a**) (1.47 g, 4.00 mmol) and  $\text{NaBF}_4$  (0.55 g, 5.00 mmol) according to the general procedure in 94 % yield (1.41 g, 3.77 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.79 (s, 1H), 7.47 (s, 1H), 7.40 (s, 1H), 5.08 (s, 2H), 4.34 (t,  $J = 4.6$  Hz, 2H), 3.92 (s, 3H), 3.73 (t,  $J = 4.6$  Hz, 2H), 3.63-3.58 (m, 6H), 3.55-3.45 (m, 2H), 3.39 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.49, 137.71, 123.83, 123.36, 71.74, 70.32, 70.28, 70.22, 68.49, 65.41, 58.79, 49.69, 36.29

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3165, 3122, 2925, 1751, 1582, 1569, 1558, 1495, 1452, 1217, 1181

MS  $m/z$ , 287.1  $[M-BF_4^-]^+$ ; MS:  $m/z$ , 86.9  $[BF_4^-]$

### **2,3-Dimethyl-1-(butoxyethoxycarbonylmethyl)imidazolium BF<sub>4</sub> (13c)**

The title compound was prepared from 2,3-dimethyl-1-(butoxycarbonylmethyl)imidazolium bromide (**13a**) (2.94 g, 8.78 mmol) and NaBF<sub>4</sub> (1.16g, 10.5 mmol) according to the general procedure in 95 % yield (2.85 g, 8.33 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 7.32 (d,  $J = 2.0$  Hz, 1H), 7.31 (d,  $J = 2.0$  Hz, 1H), 4.98 (s, 2H), 4.36 (t,  $J = 4.8$  Hz, 2H), 3.80 (s, 3H), 3.68 (t,  $J = 4.8$  Hz, 2H), 3.49 (t,  $J = 6.8$  Hz, 2H), 2.53 (s, 3H), 1.59 (tt,  $J = 6.8, 7.2$  Hz, 2H), 1.41 (tq,  $J = 7.2, 7.4$  Hz, 2H), 0.95 (t,  $J = 7.4$  Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 166.26, 145.68, 122.41, 122.35, 71.13, 67.96, 65.61, 48.90, 35.26, 31.59, 19.20, 13.90, 9.49

IR (thin film on salt plate) (cm<sup>-1</sup>) 3157, 2962, 2933, 1750, 1595, 1558, 1544, 1495, 1451, 1391, 1248, 1217

MS  $m/z$ , 255.2  $[M-BF_4^-]^+$ ; MS:  $m/z$ , 87.0  $[BF_4^-]$

### **2,3-Dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium BF<sub>4</sub> (14c)**

The title compound was prepared from 2,3-dimethyl-1-(methoxyethoxycarbonylmethyl)imidazolium bromide (**14a**) (2.94 g, 8.73 mmol) and NaBF<sub>4</sub> (1.16g, 10.5 mmol) according to the general procedure in 94 % yield (2.82 g, 8.20 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 7.64 (s, 2H), 5.30 (s, 2H), 4.36 (t,  $J = 4.7$  Hz, 2H), 3.99 (s, 3H), 3.73 (t,  $J = 4.7$  Hz, 2H), 3.62 (t,  $J = 4.6$  Hz, 2H), 3.51 (t,  $J = 4.6$  Hz, 2H), 3.31 (s, 3H), 2.73 (s, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 171.66, 151.56, 127.67, 127.57, 76.85, 75.22, 72.50, 70.48, 63.13, 53.96, 40.65, 14.68

IR (thin film on salt plate) (cm<sup>-1</sup>) 3154, 2926, 2862, 1750, 1558, 1546, 1539, 1495, 1451, 1247, 1217

MS  $m/z$ , 257.2  $[M-BF_4^-]^+$ ; MS:  $m/z$ , 87.0  $[BF_4^-]$

### **2,3-Dimethyl-1-(pentoxycarbonylmethyl)imidazolium BF<sub>4</sub> (15c)**

The title compound was prepared from 2,3-dimethyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**15a**) (2.93 g, 9.62 mmol) and NaBF<sub>4</sub> (1.28 g, 11.6 mmol) according to the general procedure in 93 % yield (2.79 g, 8.94 mmol).  
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 7.21 (s, 2H), 4.89 (s, 2H), 4.15 (t, *J* = 6.8 Hz, 2H), 3.61 (s, 3H), 2.98 (s, 3H), 1.65-1.60 (m, 2H), 1.30-1.28 (m, 4H), 0.86 (t, *J* = 6.8 Hz, 3H)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 166.24, 145.70, 122.39, 122.29, 67.06, 49.10, 35.38, 28.02, 27.80, 22.22, 13.91, 9.73  
IR (thin film on salt plate) (cm<sup>-1</sup>) 3440, 3148, 2958, 2930, 2860, 1748, 1546, 1454, 1399, 1225, 1049, 1035  
MS *m/z*, 225.2 [M-BF<sub>4</sub>]<sup>+</sup>; MS: *m/z*, 87.0 [BF<sub>4</sub>]

## PF<sub>6</sub> salts

### **3-Methyl-1-(butoxycarbonylmethyl)imidazolium PF<sub>6</sub> (1d)**

The title compound was prepared from 3-methyl-1-(butoxycarbonylmethyl)imidazolium bromide (**1a**) (2.02 g, 7.31 mmol) and KPF<sub>6</sub> (1.61 g, 8.77 mmol) according to the general procedure in 93 % yield (2.33 g, 6.81 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.06 (s, 1H), 7.79 (t, *J* = 1.8 Hz, 1H), 7.77 (t, *J* = 1.8 Hz, 1H), 5.37 (s, 2H), 4.24 (t, *J* = 6.5 Hz, 2H), 4.14 (s, 3H), 1.67 (tt, *J* = 6.5, 6.8 Hz, 2H), 1.42 (tq, *J* = 6.8, 7.3 Hz, 2H), 0.94 (t, *J* = 7.3 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.41, 138.73, 124.97, 124.56, 67.01, 50.70, 36.90, 28.86, 28.58, 14.22

IR (thin film on salt plate) (cm<sup>-1</sup>) 3178, 3127, 2966, 2871, 1751, 1582, 1569, 1559, 1495, 1452, 1398, 1218, 1181

MS *m/z*, 197.1 [M-PF<sub>6</sub>]<sup>+</sup>; MS: *m/z*, 145.0 [PF<sub>6</sub>]<sup>-</sup>

### **3-Methyl-1-(pentoxycarbonylmethyl)imidazolium PF<sub>6</sub> (2d)**

The title compound was prepared from 3-methyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**2a**) (2.44 g, 8.40 mmol) and KPF<sub>6</sub> (1.86 g, 10.1 mmol) according to the general procedure in 98 % yield (2.94 g, 8.26 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.01 (s, 1H), 7.80 (t, *J* = 1.8 Hz, 1H), 7.77 (t, *J* = 1.8 Hz, 1H), 5.40 (s, 2H), 4.32 (t, *J* = 4.8 Hz, 2H), 4.12 (s, 3H), 1.73-1.64 (m, 2H), 1.40-1.31 (m, 4H), 0.95 (t, *J* = 7.0 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.41, 138.73, 124.97, 124.56, 67.01, 50.70, 30.08, 29.51, 29.31, 28.86, 14.22

IR (thin film on salt plate) (cm<sup>-1</sup>) 3179, 3133, 2962, 2933, 2864, 1751, 1582, 1569, 1559, 1495, 1456, 1398, 1232, 1181

MS *m/z*, 211.2 [M-PF<sub>6</sub>]<sup>+</sup>; MS: *m/z*, 145.0 [PF<sub>6</sub>]<sup>-</sup>

### **3-Methyl-1-(methoxyethoxycarbonylmethyl)imidazolium PF<sub>6</sub> (3d)**

The title compound was prepared from 3-methyl-1-(methoxyethoxycarbonylmethyl)imidazolium bromide (**3a**) (2.43 g, 8.72 mmol) and



KPF<sub>6</sub> (1.93 g, 10.5 mmol) according to the general procedure in 96 % yield (2.88 g, 8.37 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 8.89 (s, 1H), 7.64 (t, *J* = 1.8 Hz, 1H), 7.61 (t, *J* = 1.8 Hz, 1H), 5.23 (s, 2H), 4.21 (t, *J* = 4.6 Hz, 2H), 3.99 (s, 3H), 3.48 (t, *J* = 4.6 Hz, 2H), 3.18 (s, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.47, 138.74, 124.96, 124.56, 70.55, 66.08, 58.78, 50.64, 36.89

MP (°C) 58 – 60

IR (KBr disc) (cm<sup>-1</sup>) 3174, 1752, 1581, 1453, 1255, 1182, 1096, 1041

MS *m/z*, 199.1 [M-PF<sub>6</sub>]<sup>+</sup>; MS: *m/z*, 145.0 [PF<sub>6</sub>]<sup>-</sup>

### 3-Methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium PF<sub>6</sub> (4d)

The title compound was prepared from 3-methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium bromide (**4a**) (2.46 g, 8.38 mmol) and KPF<sub>6</sub> (1.86 g, 10.1 mmol) according to the general procedure in 98 % yield (2.94 g, 8.21 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 8.91 (s, 1H), 7.66 (t, *J* = 1.8 Hz, 1H), 7.63 (t, *J* = 1.8 Hz, 1H), 5.24 (s, 2H), 4.20 (t, *J* = 4.7 Hz, 2H), 4.00 (s, 3H), 3.53 (t, *J* = 4.7 Hz, 2H), 3.38 (q, *J* = 7.1 Hz, 2H), 1.02 (t, *J* = 7.1 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.49, 138.76, 124.98, 124.58, 68.51, 66.56, 66.36, 50.67, 36.91, 15.48

IR (thin film on salt plate) (cm<sup>-1</sup>) 3179, 3131, 2972, 2927, 2865, 1751, 1579, 1569, 1559, 1495, 1451, 1398, 1225, 1180, 1117

MS *m/z*, 213.1 [M-PF<sub>6</sub>]<sup>+</sup>; MS: *m/z*, 145.0 [PF<sub>6</sub>]<sup>-</sup>

### 3-Methyl-1-(propoxyethoxycarbonylmethyl)imidazolium PF<sub>6</sub> (5d)

The title compound was prepared from 3-methyl-1-(propoxyethoxycarbonylmethyl)imidazolium bromide (**5a**) (2.47 g, 8.06 mmol) and KPF<sub>6</sub> (1.78 g, 9.68 mmol) according to the general procedure in 97 % yield (2.91 g, 7.82 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.08 (s, 1H), 7.81 (t, *J* = 1.8 Hz, 1H), 7.76 (t, *J* = 1.8 Hz, 1H), 5.44 (s, 2H), 4.35 (t, *J* = 4.8 Hz, 2H), 4.13 (s, 3H), 3.63 (t, *J* = 4.8 Hz, 2H), 3.41 (t, *J* = 4.8 Hz, 2H), 1.60 (tq, *J* = 4.8, 7.0 Hz, 2H), 0.90 (t, *J* = 7.0 Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.45, 138.75, 124.10, 124.58, 73.23, 68.72, 66.33, 50.68, 36.92, 23.53, 10.82

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3179, 3125, 2970, 2931, 2877, 1751, 1582, 1569, 1559, 1495, 1451, 1398, 1218, 1181, 1113

MS  $m/z$ , 227.2  $[\text{M-PF}_6]^{+}$ ; MS:  $m/z$ , 145.0  $[\text{PF}_6]^{-}$

### **3-Methyl-1-(butoxyethoxycarbonylmethyl)imidazolium $\text{PF}_6$ (6d)**

The title compound was prepared from 3-methyl-1-(butoxyethoxycarbonylmethyl)imidazolium bromide (**6a**) (2.49 g, 7.77 mmol) and  $\text{KPF}_6$  (1.70 g, 9.24 mmol) according to the general procedure in 95 % yield (2.85 g, 7.38 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.46 (s, 1H), 7.34 (t,  $J = 1.8$  Hz, 1H), 7.32 (t,  $J = 1.8$  Hz, 1H), 4.96 (s, 2H), 4.35 (t,  $J = 4.6$  Hz, 2H), 3.88 (s, 3H), 3.67 (t,  $J = 4.8$  Hz, 2H), 3.49 (t,  $J = 6.8$  Hz, 2H), 1.58 (tt,  $J = 6.8, 7.2$  Hz, 2H), 1.40 (tq,  $J = 7.2, 7.5$  Hz, 2H), 0.94 (t,  $J = 7.5$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.05, 137.24, 123.63, 123.37, 71.09, 67.87, 65.78, 49.67, 36.26, 31.55, 19.16, 13.86

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3178, 3127, 2961, 2934, 2870, 1751, 1582, 1569, 1559, 1495, 1451, 1393, 1217, 1180

MS  $m/z$ , 241.2  $[\text{M-PF}_6]^{+}$ ; MS:  $m/z$ , 145.0  $[\text{PF}_6]^{-}$

### **3-Methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium $\text{PF}_6$ (7d)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**7a**) (3.55 g, 11.0 mmol) and  $\text{KPF}_6$  (3.31 g, 18.0 mmol) according to the general procedure in 91 % yield (3.87 g, 9.97 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 8.60 (s, 1H), 7.53 (tt,  $J = 1.8, 1.8$  Hz, 2H), 5.59 (s, 2H), 4.45 (t,  $J = 4.6$  Hz, 2H), 4.00 (s, 3H), 3.82 (t,  $J = 4.6$  Hz, 2H), 3.72 (t,  $J = 4.6$  Hz, 2H), 3.62 (t,  $J = 4.6$  Hz, 2H), 3.44 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.98, 136.76, 123.33, 123.17, 71.16, 69.69, 67.85, 65.23, 57.54, 49.44, 35.84

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3172, 3124, 2926, 1751, 1580, 1569, 1559, 1495, 1457, 1218, 1181, 1106

MS  $m/z$ , 243.2  $[\text{M-PF}_6]^{+}$ ; MS:  $m/z$ , 145.0  $[\text{PF}_6]^{-}$

### **3-Methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium PF<sub>6</sub> (8d)**

The title compound was prepared from 3-methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**8a**) (2.51 g, 7.46 mmol) and KPF<sub>6</sub> (1.65 g, 8.95 mmol) according to the general procedure in 96 % yield (2.88 g, 7.16 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 8.65 (s, 1H), 7.39 (t,  $J = 1.6$  Hz, 1H), 7.31 (t,  $J = 1.6$  Hz, 1H), 5.02 (s, 2H), 4.41 (t,  $J = 4.6$  Hz, 2H), 3.96 (s, 3H), 3.78 (t,  $J = 4.6$  Hz, 2H), 3.68-3.66 (m, 2H), 3.62-3.60 (m, 2H), 3.57 (q,  $J = 7.0$  Hz, 2H), 1.23 (t,  $J = 7.0$  Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 166.30, 137.56, 123.81, 123.40, 70.06, 69.34, 68.03, 65.68, 65.18, 49.51, 35.74, 14.44

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3175, 3123, 2966, 2926, 2869, 1751, 1582, 1569, 1559, 1495, 1451, 1215, 1180, 1105

MS  $m/z$ , 257.1  $[\text{M-PF}_6]^{+}$ ; MS:  $m/z$ , 145.0  $[\text{PF}_6]^{-}$

### **3-Methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium PF<sub>6</sub> (9d)**

The title compound was prepared from 3-methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**9a**) (2.53 g, 7.21 mmol) and KPF<sub>6</sub> (1.59 g, 8.65 mmol) according to the general procedure in 91 % yield (2.72 g, 6.54 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 8.51 (s, 1H), 7.29 (s, 1H), 7.22 (s, 1H), 4.91 (s, 2H), 4.31 (t,  $J = 4.6$  Hz, 2H), 3.86 (s, 3H), 3.68 (t,  $J = 4.6$  Hz, 2H), 3.59 (t,  $J = 4.8$  Hz, 2H), 3.53 (t,  $J = 4.8$  Hz, 2H), 3.36 (t,  $J = 6.8$  Hz, 2H), 1.54 (m, 2H), 0.85 (t,  $J = 7.4$  Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  (ppm) 166.01, 137.45, 123.75, 123.29, 73.02, 70.49, 69.85, 68.47, 65.70, 49.76, 36.43, 22.73, 10.47

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3178, 3126, 2962, 2927, 2873, 1751, 1581, 1569, 1559, 1495, 1452, 1400, 1218, 1180

MS  $m/z$ , 271.3  $[\text{M-PF}_6]^{+}$ ; MS:  $m/z$ , 145.0  $[\text{PF}_6]^{-}$

### 3-Methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium PF<sub>6</sub> (10d)

The title compound was prepared from 3-methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**10a**) (2.96 g, 8.10 mmol) and KPF<sub>6</sub> (2.21 g, 12.0 mmol) according to the general procedure in 79 % yield (2.75 g, 6.40 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 8.47 (s, 1H), 7.29 (s, 1H), 7.23 (s, 1H), 4.90 (s, 2H), 4.30 (t, *J* = 4.6 Hz, 2H), 3.85 (s, 3H), 3.67 (t, *J* = 4.6 Hz, 2H), 3.58-3.56 (m, 2H), 3.52-3.50 (m, 2H), 3.40 (t, *J* = 6.8 Hz, 2H), 1.51 (tt, *J* = 6.8, 7.2 Hz, 2H), 1.28 (tq, *J* = 7.2, 7.5 Hz, 2H), 0.86 (t, *J* = 7.5 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.95, 137.48, 123.75, 123.22, 71.18, 70.52, 69.91, 68.48, 65.73, 49.75, 36.44, 19.24, 13.93

IR (thin film on salt plate) (cm<sup>-1</sup>) 3179, 3125, 2957, 2933, 2866, 1756, 1580, 1569, 1559, 1495, 1452, 1218, 1181, 1106

MS *m/z*, 285.3 [M-PF<sub>6</sub>]<sup>+</sup>; MS: *m/z*, 145.0 [PF<sub>6</sub>]<sup>-</sup>

### 3-Methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium PF<sub>6</sub> (11d)

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**11a**) (1.47 g, 4.00 mmol) and KPF<sub>6</sub> (0.92 g, 5.00 mmol) according to the general procedure in 57 % yield (0.98 g, 2.27 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 8.54 (s, 1H), 7.40 (t, *J* = 1.8 Hz, 1H), 7.35 (t, *J* = 1.8 Hz, 1H), 5.32 (s, 2H), 4.33 (t, *J* = 4.5 Hz, 2H), 3.89 (s, 3H), 3.72 (t, *J* = 4.5 Hz, 2H), 3.64-3.59 (m, 6H), 3.55 (t, *J* = 4.6 Hz, 2H), 3.33 (s, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 166.24, 137.38, 123.75, 123.37, 71.69, 70.27, 70.23, 70.17, 68.41, 65.47, 58.69, 49.59, 36.20

IR (thin film on salt plate) (cm<sup>-1</sup>) 3176, 3121, 2926, 2862, 1751, 1582, 1569, 1559, 1495, 1452, 1402, 1224, 1180

MS *m/z*, 287.3 [M-PF<sub>6</sub>]<sup>+</sup>; MS: *m/z*, 145.0 [PF<sub>6</sub>]<sup>-</sup>

### 2,3-Dimethyl-1-(butoxyethoxycarbonylmethyl)imidazolium PF<sub>6</sub> (13d)

The title compound was prepared from 2,3-dimethyl-1-(butoxyethoxycarbonylmethyl)imidazolium bromide (**13a**) (2.51 g, 7.50 mmol) and KPF<sub>6</sub> (1.66 g, 9.00 mmol) according to the general procedure in 97 % yield (2.91 g, 7.28 mmol). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 7.25 (d, *J* = 2.4 Hz, 1H), 7.22 (d, *J* = 2.4 Hz, 1H), 4.89 (s, 2H), 4.35 (t, *J* = 4.8 Hz, 2H), 3.77 (s, 3H), 3.67-3.65 (m, 2H), 3.49 (t, *J* = 6.6 Hz, 2H), 2.51 (s, 3H), 1.59-1.52 (m, 2H), 1.41-1.32 (m, 2H), 0.94 (t, *J* = 7.4 Hz, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.98, 145.59, 122.38, 122.21, 71.09, 67.90, 65.70, 48.80, 35.18, 31.59, 19.19, 13.88, 9.24. IR (thin film on salt plate) (cm<sup>-1</sup>) 3163, 2962, 2931, 2867, 1751, 1596, 1559, 1539, 1495, 1451, 1392, 1245, 1218, 1123. MS *m/z*, 255.2 [M-PF<sub>6</sub>]<sup>+</sup>; MS: *m/z*, 145.0 [PF<sub>6</sub>]<sup>-</sup>.

#### **2,3-Dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium PF<sub>6</sub> (14d)**

The title compound was prepared from 2,3-dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**14a**) (2.51 g, 7.46 mmol) and KPF<sub>6</sub> (1.65 g, 8.95 mmol) according to the general procedure in 95 % yield (2.84 g, 7.06 mmol). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 7.59 (s, 2H), 5.27 (s, 2H), 4.38 (t, *J* = 4.6 Hz, 2H), 3.98 (s, 3H), 3.73 (t, *J* = 4.6 Hz, 2H), 3.63 (t, *J* = 4.6 Hz, 2H), 3.52 (t, *J* = 4.6 Hz, 2H), 3.12 (s, 3H), 2.72 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.27, 147.21, 123.38, 123.22, 72.46, 70.88, 69.20, 66.23, 58.81, 49.65, 35.74, 9.70. IR (thin film on salt plate) (cm<sup>-1</sup>) 3160, 2926, 2861, 1751, 1596, 1559, 1539, 1495, 1452, 1400, 1245, 1217, 1106. MS *m/z*, 257.2 [M-PF<sub>6</sub>]<sup>+</sup>; MS: *m/z*, 145.0 [PF<sub>6</sub>]<sup>-</sup>.

#### **2,3-Dimethyl-1-(pentoxycarbonylmethyl)imidazolium PF<sub>6</sub> (15d)**

The title compound was prepared from 2,3-dimethyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**15a**) (2.47 g, 8.11 mmol) and KPF<sub>6</sub> (1.79 g, 9.73 mmol) according to the general procedure in 97 % yield (2.91 g, 7.86 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 7.61 (s, 2H), 5.28 (s, 2H), 4.23 (t,  $J = 6.6$  Hz, 2H), 4.0 (s, 3H), 3.73 (s, 3H), 1.71-1.64 (m, 2H), 1.37-1.31 (m, 4H), 0.92 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.27, 147.15, 123.39, 123.26, 67.08, 49.46, 35.76, 28.83, 28.58, 22.91, 74.24, 9.73

MP ( $^\circ\text{C}$ ) 40 – 42

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3165, 2956, 2930, 1752, 1399, 1253, 1231, 1212, 1049

MS  $m/z$ , 225.2  $[\text{M-PF}_6]^{+}$ ; MS:  $m/z$ , 145.0  $[\text{PF}_6]^{-}$

## N(CN)<sub>2</sub> salts

### **3-Methyl-1-(butoxycarbonylmethyl)imidazolium N(CN)<sub>2</sub> (1e)**

The title compound was prepared from 3-methyl-1-(butoxycarbonylmethyl)imidazolium bromide (**1a**) (3.05 g, 11.0 mmol) and NaNCNCN (1.42 g, 16.0 mmol) according to the general procedure in 87 % yield (2.51 g, 9.54 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.82 (s, 1H), 7.56 (t, *J* = 1.8 Hz, 1H), 7.46 (t, *J* = 1.8 Hz, 1H), 5.32 (s, 2H), 4.15 (t, *J* = 6.8 Hz, 2H), 4.02 (s, 3H), 1.61 (tt, *J* = 6.8, 7.2 Hz, 2H), 1.33 (tq, *J* = 7.2, 7.5 Hz, 2H), 0.87 (t, *J* = 7.5 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 164.10, 136.12, 121.89, 121.18, 64.85, 48.22, 34.87, 28.31, 16.96, 11.67 Note: C's from anion are not visible in <sup>13</sup>C NMR

IR (thin film on salt plate) (cm<sup>-1</sup>) 2962, 2931, 2861, 2241, 2139, 1750, 1569, 1558, 1539, 1495, 1452, 1217, 1177

MS *m/z*, 197.1 [M-N(CN)<sub>2</sub>]<sup>+</sup>; MS: *m/z*, 66.0 [N(CN)<sub>2</sub>]<sup>-</sup>

### **3-Methyl-1-(pentoxycarbonylmethyl)imidazolium N(CN)<sub>2</sub> (2e)**

The title compound was prepared from 3-methyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**2a**) (3.20 g, 11.0 mmol) and NaNCNCN (1.34 g, 15.00 mmol) according to the general procedure in 98 % yield (3.00 g, 10.8 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.66 (s, 1H), 7.63 (t, *J* = 1.8 Hz, 1H), 7.56 (t, *J* = 1.8 Hz, 1H), 5.29 (s, 2H), 4.13 (t, *J* = 6.8 Hz, 2H), 4.02 (s, 3H), 1.62-1.59 (m, 2H), 1.26-1.22 (m, 4H), 0.84 (t, *J* = 6.8 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 164.05, 135.78, 121.97, 121.34, 65.02, 48.12, 34.78, 25.94, 25.74, 20.16, 11.90 Note: C's from anion are not visible in <sup>13</sup>C NMR

IR (thin film on salt plate) (cm<sup>-1</sup>) 2958, 2933, 2861, 2240, 2138, 1750, 1569, 1558, 1495, 1457, 1229, 1177

MS *m/z*, 211.2 [M-N(CN)<sub>2</sub>]<sup>+</sup>; MS: *m/z*, 66.0 [N(CN)<sub>2</sub>]<sup>-</sup>

### **3-Methyl-1-(methoxyethoxycarbonylmethyl)imidazolium N(CN)<sub>2</sub> (3e)**

The title compound was prepared from 3-methyl-1-(methoxyethoxycarbonylmethyl)imidazolium bromide (**3a**) (3.35 g, 12.0 mmol) and

NaN(CN)<sub>2</sub> (1.78 g, 20.0 mmol) according to the general procedure in 80 % yield (2.55 g, 9.62 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.81 (s, 1H), 7.66 (t, *J* = 1.8 Hz, 1H), 7.55 (t, *J* = 1.8 Hz, 1H), 5.44 (s, 2H), 4.35 (t, *J* = 4.5 Hz, 2H), 4.06 (s, 3H), 3.63 (t, *J* = 4.5 Hz, 2H), 3.37 (s, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 164.30, 136.09, 121.94, 121.24, 67.86, 63.55, 56.95, 48.22, 34.91 Note: C's from anion are not visible in <sup>13</sup>C NMR

IR (thin film on salt plate) (cm<sup>-1</sup>) 3099, 2928, 2857, 1750, 1636, 1574, 1558, 1495, 1452, 1378, 1216, 1176

MS *m/z*, 199.1 [M-N(CN)<sub>2</sub>]<sup>+</sup>; MS: *m/z*, 66.0 [N(CN)<sub>2</sub>]<sup>-</sup>

### 3-Methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium N(CN)<sub>2</sub> (4e)

The title compound was prepared from 3-methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium bromide (4a) (2.84 g, 9.70 mmol) and NaN(CN)<sub>2</sub> (0.98 g, 11.0 mmol) according to the general procedure in 99 % yield (2.68 g, 9.61 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.95 (s, 1H), 7.60 (t, *J* = 1.6 Hz, 1H), 7.50 (t, *J* = 1.6 Hz, 1H), 5.45 (s, 2H), 4.37 (t, *J* = 4.6 Hz, 2H), 4.09 (s, 2H), 3.68 (t, *J* = 4.6 Hz, 2H), 3.55 (q, *J* = 7.0 Hz, 2H), 1.21 (t, *J* = 7.0 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 166.20, 138.22, 123.86, 123.14, 67.72, 66.69, 65.85, 50.23, 36.91, 15.12 Note: C's from anion are not visible in <sup>13</sup>C NMR

IR (thin film on salt plate) (cm<sup>-1</sup>) 2974, 2928, 2862, 2139, 1750, 1633, 1569, 1558, 1495, 1451, 1217, 1177, 1115

MS *m/z*, 213.1 [M-N(CN)<sub>2</sub>]<sup>+</sup>; MS: *m/z*, 66.0 [N(CN)<sub>2</sub>]<sup>-</sup>

### 3-Methyl-1-(propoxyethoxycarbonylmethyl)imidazolium N(CN)<sub>2</sub> (5e)

The title compound was prepared from 3-methyl-1-(propoxyethoxycarbonylmethyl)imidazolium bromide (5a) (3.38 g, 11.0 mmol) and NaN(CN)<sub>2</sub> (1.42 g, 16.0 mmol) according to the general procedure in 91 % yield (2.93 g, 10.0 mmol).



$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.82 (s, 1H), 7.61 (t,  $J = 1.8$  Hz, 1H), 7.53 (t,  $J = 1.8$  Hz, 1H), 5.41 (s, 2H), 4.35 (t,  $J = 4.6$  Hz, 2H), 4.07 (s, 3H), 3.66 (t,  $J = 4.6$  Hz, 2H), 3.42 (t,  $J = 6.8$  Hz, 2H), 1.59 (tq,  $J = 6.8, 7.4$  Hz, 2H), 0.90 (t,  $J = 7.4$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.16, 138.13, 123.86, 123.22, 73.02, 67.89, 65.83, 50.22, 36.90, 22.72, 10.49 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2962, 2927, 2861, 2139, 1751, 1636, 1558, 1539, 1495, 1452, 1216, 1175, 1106

MS  $m/z$ , 227.2  $[\text{M}-\text{N}(\text{CN})_2]^+$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2^-]$

### **3-Methyl-1-(butoxyethoxycarbonylmethyl)imidazolium $\text{N}(\text{CN})_2$ (6e)**

The title compound was prepared from 3-methyl-1-(butoxyethoxycarbonylmethyl)imidazolium bromide (**6a**) (3.85 g, 12.0 mmol) and  $\text{NaN(CN)}_2$  (1.78 g, 20.0 mmol) according to the general procedure in 51 % yield (1.87 g, 6.09 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.87 (s, 1H), 7.58 (t,  $J = 1.8$  Hz, 1H), 7.50 (t,  $J = 1.8$  Hz, 1H), 5.41 (s, 2H), 4.36 (t,  $J = 4.8$  Hz, 2H), 4.08 (s, 3H), 3.67 (t,  $J = 4.8$  Hz, 2H), 3.46 (t,  $J = 6.8$  Hz, 2H), 1.55 (tt,  $J = 6.8, 7.2$  Hz, 2H), 1.35 (tq,  $J = 7.2, 7.5$  Hz, 2H), 0.91 (t,  $J = 7.5$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.10, 138.21, 123.83, 123.14, 71.22, 67.92, 65.87, 50.23, 36.91, 31.57, 19.21, 13.94 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR  
IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2960, 2933, 2865, 2139, 1751, 1633, 1569, 1558, 1495, 1452, 1215, 1177, 1117

MS  $m/z$ , 241.2  $[\text{M}-\text{N}(\text{CN})_2]^+$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2^-]$

### **3-Methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium $\text{N}(\text{CN})_2$ (7e)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**7a**) (2.91 g, 9.00 mmol) and  $\text{NaN(CN)}_2$  (0.89 g, 10.0 mmol) according to the general procedure in 94 % yield (2.59 g, 8.38 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.95 (s, 1H), 7.49 (t,  $J = 1.6$  Hz, 1H), 7.30 (t,  $J = 1.6$  Hz, 1H), 5.38 (s, 2H), 4.33 (t,  $J = 4.6$  Hz, 2H), 4.01 (s, 3H), 3.68 (t,  $J = 4.6$  Hz, 2H), 3.59-3.53 (m, 2H), 3.50-3.44 (m, 2H), 3.31 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.14, 138.63, 123.85, 122.81, 71.97, 70.47, 68.53, 65.70, 59.03, 50.26, 36.90 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2926, 2859, 2139, 1750, 1566, 1558, 1495, 1452, 1217, 1175, 1104

MS  $m/z$ , 243.2  $[\text{M}-\text{N}(\text{CN})_2]^{+}$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2]^{-}$

### **3-Methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium $\text{N}(\text{CN})_2$ (8e)**

The title compound was prepared from 3-methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**8a**) (2.53 g, 7.50 mmol) and  $\text{NaN(CN)}_2$  (0.76 g, 8.50 mmol) according to the general procedure in 99 % yield (2.40 g, 7.43 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.01 (s, 1H), 7.61 (t,  $J = 1.8$  Hz, 1H), 7.43 (t,  $J = 1.8$  Hz, 1H), 5.46 (s, 2H), 4.40 (t,  $J = 4.8$  Hz, 2H), 4.09 (s, 3H), 3.76 (t,  $J = 4.8$  Hz, 2H), 3.67-3.65 (m, 2H), 3.62-3.59 (m, 2H), 3.55 (q,  $J = 7.0$  Hz, 2H), 1.21 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.16, 138.47, 123.92, 122.91, 70.65, 69.70, 68.53, 66.67, 65.71, 50.94, 36.90, 15.18 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2927, 2868, 2139, 1750, 1636, 1569, 1558, 1495, 1451, 1215, 1177, 1105

MS  $m/z$ , 257.2  $[\text{M}-\text{N}(\text{CN})_2]^{+}$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2]^{-}$

### **3-Methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium $\text{N}(\text{CN})_2$ (9e)**

The title compound was prepared from 3-methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**9a**) (2.70 g, 7.70 mmol) and  $\text{NaN(CN)}_2$  (0.80 g, 9.00 mmol) according to the general procedure in 85 % yield (2.20 g, 6.53 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.03 (s, 1H), 7.61 (t,  $J = 1.8$  Hz, 1H), 7.43 (t,  $J = 1.8$  Hz, 1H), 5.46 (s, 2H), 4.39 (t,  $J = 4.6$  Hz, 2H), 4.09 (s, 3H), 3.76 (t,  $J = 4.6$  Hz, 2H),

3.66-3.64 (m, 2H), 3.60-3.57 (m, 2H), 3.43 (t,  $J = 6.9$  Hz, 2H), 1.61 (tq,  $J = 6.9, 7.6$  Hz, 2H), 0.92 (t,  $J = 7.6$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.15, 138.47, 123.90, 122.90, 73.09, 70.61, 69.92, 68.53, 65.74, 50.23, 36.90, 22.77, 10.53 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2963, 2927, 2863, 2139, 1751, 1635, 1568, 1558, 1495, 1452, 1217, 1175, 1105

MS  $m/z$ , 271.3  $[\text{M}-\text{N}(\text{CN})_2]^{+}$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2]^{-}$

### **3-Methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium $\text{N}(\text{CN})_2$ (10e)**

The title compound was prepared from 3-methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**10a**) (2.92 g, 8.00 mmol) and  $\text{NaN(CN)}_2$  (0.80 g, 9.00 mmol) according to the general procedure in 98 % yield (2.75 g, 7.83 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 10.23 (s, 1H), 7.41 (t,  $J = 1.8$  Hz, 1H), 7.23 (t,  $J = 1.8$  Hz, 1H), 5.40 (s, 2H), 4.32 (t,  $J = 4.6$  Hz, 2H), 4.01 (s, 3H), 3.68 (t,  $J = 4.6$  Hz, 2H), 3.58-3.55 (m, 2H), 3.54-3.50 (m, 2H), 3.39 (t,  $J = 6.7$  Hz, 2H), 1.49 (tt,  $J = 6.7, 7.6$  Hz, 2H), 1.28 (tq,  $J = 7.6, 7.2$  Hz, 2H), 0.85 (t,  $J = 7.2$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 164.19, 136.12, 122.00, 121.91, 69.19, 68.58, 67.93, 66.53, 63.70, 48.20, 34.89, 29.63, 17.24, 11.96 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR

Mp ( $^{\circ}\text{C}$ ) 34 – 36  $^{\circ}\text{C}$

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3435, 2958, 2867, 2140, 1752, 1635, 1222, 1177, 1100

MS  $m/z$ , 285.3  $[\text{M}-\text{N}(\text{CN})_2]^{+}$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2]^{-}$

### **3-Methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium $\text{N}(\text{CN})_2$ (11e)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**11a**) (2.94 g, 8.00 mmol) and  $\text{NaN(CN)}_2$  (0.80 g, 9.00 mmol) according to the general procedure in 75 % yield (2.12 g, 6.01 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.72 (s, 1H), 7.67 (d,  $J = 1.6$  Hz, 1H), 7.50 (d,  $J = 1.6$  Hz, 1H), 5.40 (s, 2H), 4.38 (t,  $J = 4.6$  Hz, 2H), 4.07 (s, 3H), 3.74 (t,  $J = 4.6$  Hz, 2H), 3.65-3.60 (m, 6H), 3.56-3.53 (m, 2H), 3.37 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.18, 138.18, 124.06, 123.14, 71.79, 70.45, 70.42, 70.35, 68.49, 65.56, 58.88, 50.17, 36.82 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2925, 2859, 2242, 2139, 1751, 1635, 1566, 1558, 1495, 1452, 1217, 1176

MS  $m/z$ , 287.2  $[\text{M}-\text{N}(\text{CN})_2]^{+}$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2]^{-}$

### **2,3-Dimethyl-1-(butoxyethoxycarbonylmethyl)imidazolium $\text{N}(\text{CN})_2$ (13e)**

The title compound was prepared from 2,3-dimethyl-1-(butoxyethoxycarbonylmethyl)imidazolium bromide (**13a**) (3.02 g, 9.00 mmol) and  $\text{NaN(CN)}_2$  (1.07 g, 12.0 mmol) according to the general procedure in 78 % yield (2.25 g, 7.01 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 7.71 (d,  $J = 2.0$  Hz, 1H), 7.53 (d,  $J = 2.0$  Hz, 1H), 5.36 (s, 2H), 4.37 (t,  $J = 4.6$  Hz, 2H), 3.95 (s, 3H), 3.67 (t,  $J = 4.6$  Hz, 2H), 3.47 (t,  $J = 6.7$  Hz, 2H), 2.71 (s, 3H), 1.57 (tt,  $J = 6.7, 7.2$  Hz, 2H), 1.37 (tq,  $J = 7.2, 7.5$  Hz, 2H), 0.93 (t,  $J = 7.5$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.13, 145.69, 122.87, 122.47, 71.22, 67.95, 65.78, 49.79, 35.97, 31.60, 19.23, 13.94, 10.78 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2957, 2933, 2864, 2139, 1751, 1635, 1558, 1539, 1495, 1452, 1217, 1120

MS  $m/z$ , 255.2  $[\text{M}-\text{N}(\text{CN})_2]^{+}$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2]^{-}$

### **2,3-Dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium $\text{N}(\text{CN})_2$ (14e)**

The title compound was prepared from 2,3-dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**14a**) (2.90 g, 8.48 mmol) and  $\text{NaN(CN)}_2$  (0.84 g, 9.40 mmol) according to the general procedure in 99 % yield (2.74 g, 8.48 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 7.69 (d,  $J = 2.2$  Hz, 1H), 7.51 (d,  $J = 2.2$  Hz, 1H), 3.34 (s, 2H), 4.40 (t,  $J = 4.6$  Hz, 2H), 3.95 (s, 3H), 3.75 (t,  $J = 4.6$  Hz, 2H), 3.66-3.63 (m, 2H), 3.57-3.55 (m, 2H), 3.38 (s, 3H), 2.72 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.09, 145.74, 122.87, 122.46, 71.78, 70.45, 68.45, 65.66, 59.02, 49.73, 35.92, 10.67 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR  
IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2953, 2926, 2859, 2239, 2139, 1751, 1558, 1539, 1495, 1452, 1216, 1103

MS  $m/z$ , 257.2  $[\text{M}-\text{N}(\text{CN})_2]^{+}$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2]^{-}$

### **2,3-Dimethyl-1-(pentoxycarbonylmethyl)imidazolium $\text{N}(\text{CN})_2$ (**15e**)**

The title compound was prepared from 2,3-dimethyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**15a**) (3.66 g, 12.0 mmol) and  $\text{NaN(CN)}_2$  (1.78 g, 20.0 mmol) according to the general procedure in 85 % yield (2.96 g, 10.2 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 7.70 (d,  $J = 2.0$  Hz, 1H), 7.55 (d,  $J = 2.0$  Hz, 1H), 5.32 (s, 2H), 4.21 (t,  $J = 7.0$  Hz, 2H), 3.95 (s, 3H), 2.71 (s, 3H), 1.68-1.65 (m, 2H), 1.34-1.30 (m, 4H), 0.91 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.15, 145.60, 122.84, 122.47, 67.13, 49.82, 33.99, 28.04, 27.80, 22.23, 13.95, 10.84 Note: C's from anion are not visible in  $^{13}\text{C}$  NMR  
IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2959, 2933, 2862, 2136, 1751, 1635, 1558, 1539, 1495, 1456, 1228, 1217, 1168

MS  $m/z$ , 225.2  $[\text{M}-\text{N}(\text{CN})_2]^{+}$ ; MS:  $m/z$ , 66.0  $[\text{N}(\text{CN})_2]^{-}$

## OctSO<sub>4</sub> salts

### **3-Methyl-1-(butoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (1f)**

The title compound was prepared from 3-methyl-1-(butoxycarbonylmethyl)imidazolium bromide (**1a**) (2.58 g, 9.30 mmol) and sodium octyl sulphate (1.93 g, 8.30 mmol) according to the general procedure in 61 % yield (2.07 g, 5.09 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.40 (s, 1H), 7.38 (t, *J* = 1.8 Hz, 1H), 7.29 (t, *J* = 1.8 Hz, 2H), 5.14 (s, 2H), 4.14 (t, *J* = 6.6 Hz, 2H), 3.93 (s, 3H), 1.63-1.55 (m, 4H), 1.36-1.14 (m, 14H), 0.89 (t, *J* = 7.2 Hz, 3H), 0.82 (t, *J* = 6.8 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.40, 138.97, 123.63, 122.95, 68.07, 66.71, 49.95, 36.60, 31.83, 30.34, 29.47, 29.35, 29.26, 25.86, 22.66, 18.96, 14.12, 13.65

IR (thin film on salt plate) (cm<sup>-1</sup>) 3460, 3115, 2926, 1752, 1569, 1468, 1227, 1060

MS *m/z*, 197.1 [M-OctOSO<sub>3</sub>]<sup>+</sup>; MS: *m/z*, 209.0 [OctOSO<sub>3</sub>]<sup>-</sup>

### **3-Methyl-1-(pentoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (2f)**

The title compound was prepared from 3-methyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**2a**) (2.62 g, 9.00 mmol) and sodium octyl sulphate (1.62 g, 7.00 mmol) according to the general procedure in 96 % yield (2.82 g, 6.70 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.51 (s, 1H), 7.36 (t, *J* = 1.6 Hz, 1H), 7.27 (t, *J* = 1.6 Hz, 1H), 5.15 (s, 2H), 4.13 (t, *J* = 7.0 Hz, 2H), 3.94 (m, 5H), 1.61-1.57 (m, 4H), 1.25-1.20 (m, 14H), 0.83-0.78 (m, 6H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 166.28, 139.22, 123.56, 122.86, 68.01, 67.00, 50.01, 36.60, 31.81, 29.50, 29.33, 29.23, 28.03, 27.81, 25.85, 22.63, 20.01, 14.06, 13.87

IR (thin film on salt plate) (cm<sup>-1</sup>) 2957, 2926, 2858, 1751, 1558, 1539, 1495, 1452

MS *m/z*, 211.2 [M-OctOSO<sub>3</sub>]<sup>+</sup>; MS: *m/z*, 209.1 [OctOSO<sub>3</sub>]<sup>-</sup>

### **3-Methyl-1-(methoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (3f)**

The title compound was prepared from 3-methyl-1-(methoxyethoxycarbonylmethyl)imidazolium bromide (**3a**) (2.65g, 9.50 mmol) and sodium octyl sulphate (1.97 g, 8.50 mmol) according to the general procedure in 95 % yield (3.30 g, 8.07 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.51 (s, 1H), 7.44 (s, 1H), 7.33 (s, 1H), 5.25 (s, 2H), 4.30 (t,  $J = 4.6$  Hz, 2H), 3.95 (m, 5H), 3.57 (t,  $J = 4.6$  Hz, 2H), 3.31 (s, 3H), 1.60 (tt,  $J = 6.8, 7.4$  Hz, 2H), 1.29-1.19 (m, 10H), 0.82 (t,  $J = 6.8$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.43, 138.75, 123.75, 122.99, 69.87, 68.10, 65.47, 58.95, 50.05, 36.73, 31.83, 29.45, 29.34, 29.26, 25.85, 22.67, 14.13

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2952, 2925, 2857, 1751, 1558, 1539, 1495, 1452, 1257, 1217, 1176

MS  $m/z$ , 199.2 [ $\text{M-OctOSO}_3^-$ ] $^+$ ; MS:  $m/z$ , 209.1 [ $\text{OctOSO}_3^-$ ]

### **3-Methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (4f)**

The title compound was prepared from 3-methyl-1-(ethoxyethoxycarbonylmethyl)imidazolium bromide (**4a**) (2.93 g, 10.0 mmol) and sodium octyl sulphate (1.86 g, 8.00 mmol) according to the general procedure in 96 % yield (3.24 g, 7.66 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.42 (s, 1H), 7.37 (s, 1H), 7.28 (s, 1H), 5.17 (s, 2H), 4.29 (t,  $J = 4.7$  Hz, 2H), 3.94 (m, 5H), 3.60 (t,  $J = 4.7$  Hz, 2H), 3.48 (q,  $J = 7.1$  Hz, 2H), 1.63 (tt,  $J = 6.8, 7.2$  Hz, 2H), 1.29-1.15 (m, 10H), 1.15 (t,  $J = 7.1$  Hz, 3H), 0.82 (t,  $J = 6.8$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.45, 138.89, 123.67, 122.98, 68.23, 67.76, 66.72, 65.70, 49.96, 36.62, 31.83, 29.43, 29.34, 29.26, 25.83, 22.67, 15.07, 14.13

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2955, 2926, 2858, 1751, 1558, 1539, 1495, 1452, 1402, 1217, 1176, 1107

MS  $m/z$ , 213.2 [ $\text{M-OctOSO}_3^-$ ] $^+$ ; MS:  $m/z$ , 209.1 [ $\text{OctOSO}_3^-$ ]

### **3-Methyl-1-(propoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (5f)**

The title compound was prepared from 3-methyl-1-(propoxyethoxycarbonylmethyl)imidazolium bromide (**5a**) (3.68 g, 12.0 mmol) and sodium octyl sulphate (2.09 g, 9.00 mmol) according to the general procedure in 85 % yield (3.33 g, 7.62 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.45 (s, 1H), 7.48 (t,  $J = 1.6$  Hz, 1H), 7.41 (t,  $J = 1.6$  Hz, 1H), 5.25 (s, 2H), 4.36 (t,  $J = 4.7$  Hz, 2H), 4.01 (m, 5H), 3.67 (t,  $J = 4.7$  Hz, 2H), 3.43 (t,  $J = 6.8$  Hz, 2H), 1.63-1.58 (m, 4H), 1.56-1.29 (m, 10H), 0.92-0.86 (m, 6H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.45, 138.89, 123.71, 123.06, 73.04, 67.92, 67.89, 65.67, 49.91, 36.58, 31.83, 29.50, 29.36, 29.26, 25.87, 22.73, 22.66, 14.13, 10.47

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3118, 2958, 2927, 2855, 1750, 1569, 1558, 1539, 1495, 1455, 1217, 1178, 1108

MS  $m/z$ , 227.1 [ $\text{M-OctOSO}_3^-$ ] $^+$ ; MS:  $m/z$ , 209.0 [ $\text{OctOSO}_3^-$ ]

### **3-Methyl-1-(butoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (6f)**

The title compound was prepared from 3-methyl-1-(butoxyethoxycarbonylmethyl)imidazolium bromide (**6a**) (3.15 g, 9.80 mmol) and sodium octyl sulphate (1.81 g, 7.80 mmol) according to the general procedure in 93 % yield (3.27 g, 7.25 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.49 (s, 1H), 7.36 (t,  $J = 1.6$  Hz, 1H), 7.28 (t,  $J = 1.6$  Hz, 1H), 5.24 (s, 2H), 4.28 (t,  $J = 4.8$  Hz, 2H), 3.94 (m, 5H), 3.59 (t,  $J = 4.8$  Hz, 2H), 3.40 (t,  $J = 6.8$  Hz, 2H), 1.51 (tt,  $J = 6.8, 6.8$  Hz, 2H), 1.28 (tq,  $J = 6.8, 7.1$  Hz, 2H), 1.34-1.14 (m, 12H), 0.86 (t,  $J = 7.1$  Hz, 3H), 0.80 (t,  $J = 7.2$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.32, 139.12, 123.59, 122.92, 71.25, 67.99, 67.95, 65.78, 49.96, 36.65, 31.84, 31.60, 29.49, 29.36, 29.28, 25.87, 22.68, 19.24, 14.15, 13.95

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3114, 2954, 2927, 2858, 1751, 1567, 1558, 1539, 1495, 1455, 1217, 1112

MS  $m/z$ , 241.2 [ $\text{M-OctOSO}_3^-$ ] $^+$ ; MS:  $m/z$ , 209.1 [ $\text{OctOSO}_3^-$ ]

### **3-Methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (7f)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**7a**) (3.23 g, 10.0 mmol) and sodium octyl sulphate (2.09 g, 9.00 mmol) according to the general procedure in 82 % yield (3.34 g, 7.37 mmol).



$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.23 (s, 1H), 7.47 (t,  $J = 1.8$  Hz, 1H), 7.36 (t,  $J = 1.8$  Hz, 1H), 5.17 (s, 2H), 4.38 (t,  $J = 4.6$  Hz, 2H), 3.92 (m, 5H), 3.67 (t,  $J = 4.6$  Hz, 2H), 3.58-3.53 (m, 2H), 3.49-3.44 (m, 2H), 3.30 (s, 3H), 1.60 (tt,  $J = 6.8, 7.4$  Hz, 2H), 1.27-1.14 (m, 10H), 0.82 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.67, 138.55, 123.87, 123.14, 71.71, 70.32, 68.58, 68.06, 65.43, 58.96, 49.90, 36.55, 31.84, 29.45, 29.37, 29.27, 25.85, 22.66, 14.13

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2954, 2926, 2859, 1750, 1558, 1539, 1495, 1455, 1401, 1364, 1203, 1174, 1102

MS  $m/z$ , 243.2 [ $\text{M-OctOSO}_3^-$ ] $^+$ ; MS:  $m/z$ , 209.1 [ $\text{OctOSO}_3^-$ ]

### **3-Methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (8f)**

The title compound was prepared from 3-methyl-1-(ethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**8a**) (3.20 g, 9.50 mmol) and sodium octyl sulphate (1.86 g, 8.00 mmol) according to the general procedure in 93 % yield (3.47 g, 7.21 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.44 (s, 1H), 7.52 (s, 1H), 7.40 (s, 1H), 5.23 (s, 2H), 4.37 (t,  $J = 4.8$  Hz, 2H), 4.02 (m, 5H), 3.75 (t,  $J = 4.8$  Hz, 2H), 3.66-3.63 (m, 2H), 3.61-3.57 (m, 2H), 3.55 (q,  $J = 7.1$  Hz, 2H), 1.70 (tt,  $J = 6.8, 7.4$  Hz, 2H), 1.38-1.27 (m, 10H), 1.23 (t,  $J = 7.1$  Hz, 3H), 0.89 (t,  $J = 6.8$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.46, 138.86, 123.82, 123.01, 70.61, 69.71, 68.57, 68.04, 66.66, 65.63, 49.88, 36.57, 31.82, 29.47, 29.35, 29.26, 25.85, 22.66, 15.15, 14.12

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2957, 2927, 2858, 1751, 1558, 1639, 1495, 1452, 1399, 1260, 1217, 1178, 1106

MS  $m/z$ , 257.1 [ $\text{M-OctOSO}_3^-$ ] $^+$ ; MS:  $m/z$ , 209.0 [ $\text{OctOSO}_3^-$ ]

### **3-Methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (9f)**

The title compound was prepared from 3-methyl-1-(propoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**9a**) (0.78 g, 2.23 mmol) and sodium octyl sulphate (0.42 g, 1.80 mmol) according to the general procedure in 98 % yield (0.85 g, 1.77 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.41 (s, 1H), 7.45 (t, *J* = 1.8 Hz, 1H), 7.33 (t, *J* = 1.8 Hz, 1H), 5.17 (s, 2H), 4.29 (t, *J* = 4.8 Hz, 2H), 3.94-3.91 (m, 5H), 3.67 (t, *J* = 4.8 Hz, 2H), 3.58-3.54 (m, 2H), 3.53-3.49 (m, 2H), 3.35 (t, *J* = 6.8 Hz, 2H), 1.62-1.48 (m, 14H), 0.85-0.80 (m, 6H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 166.46, 138.88, 123.82, 123.00, 73.10, 70.58, 70.46, 70.14, 69.93, 67.92, 65.56, 61.82, 36.59, 31.83, 29.49, 29.36, 29.27, 25.87, 22.76, 22.67, 14.13

IR (thin film on salt plate) (cm<sup>-1</sup>) 2956, 2927, 2859, 1751, 1558, 1539, 1495, 1455, 1217, 1106

MS *m/z*, 271.3 [M-OctOSO<sub>3</sub><sup>-</sup>]<sup>+</sup>; MS: *m/z*, 209.1 [OctOSO<sub>3</sub><sup>-</sup>]

### **3-Methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (10f)**

The title compound was prepared from 3-Methyl-1-(butoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**10a**) (2.19 g, 6.00 mmol) and sodium octyl sulphate (1.16 g, 5.00 mmol) according to the general procedure in 92 % yield (2.28 g, 4.61 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.34 (s, 1H), 7.50 (t, *J* = 1.8 Hz, 1H), 7.41 (t, *J* = 1.8 Hz, 1H), 5.15 (s, 2H), 4.28 (t, *J* = 4.8 Hz, 2H), 3.93 (m, 5H), 3.67 (t, *J* = 4.8 Hz, 2H), 3.57-3.53 (m, 2H), 3.52-3.48 (m, 2H), 3.38 (t, *J* = 6.8 Hz, 2H), 1.52 (tt, *J* = 6.8, 7.2 Hz, 2H), 1.28 (tq, *J* = 7.2, 6.8 Hz, 2H), 1.32-1.12 (m, 12H), 0.86-0.78 (m, 6H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 166.48, 138.71, 123.91, 123.16, 71.25, 71.20, 70.56, 68.55, 67.77, 65.52, 49.79, 36.51, 31.81, 31.62, 29.50, 29.35, 29.25, 25.87, 22.64, 19.23, 14.10, 13.93

IR (thin film on salt plate) (cm<sup>-1</sup>) 2953, 2927, 2859, 1750, 1558, 1539, 1495, 1455, 1217, 1110

MS *m/z*, 285.2 [M-OctOSO<sub>3</sub><sup>-</sup>]<sup>+</sup>; MS: *m/z*, 209.0 [OctOSO<sub>3</sub><sup>-</sup>]

### **3-Methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (11f)**

The title compound was prepared from 3-methyl-1-(methoxyethoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**11a**) (2.20 g, 6.00

mmol) and sodium octyl sulphate (1.62 g, 7.00 mmol) according to the general procedure in 84 % yield (2.51 g, 5.05 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.36 (s, 1H), 7.44 (t,  $J = 1.6$  Hz, 1H), 7.28 (t,  $J = 1.6$  Hz, 1H), 5.23 (s, 2H), 4.31 (t,  $J = 4.6$  Hz, 2H), 3.96-3.90 (m, 5H), 3.67-3.61 (m, 2H), 3.59-3.53 (m, 6H), 3.29 (s, 3H), 1.61 (tt,  $J = 6.8, 7.4$  Hz, 2H), 1.29-1.19 (m, 12H), 0.82 (t,  $J = 6.8$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.77, 138.37, 123.91, 123.25, 70.34, 70.31, 70.26, 70.14, 68.56, 68.04, 65.30, 58.88, 49.86, 36.47, 31.82, 29.42, 29.35, 29.25, 25.83, 22.64, 14.10

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 2951, 2926, 2859, 1751, 1566, 1558, 1539, 1495, 1456, 1399, 1217, 1106

MS  $m/z$ , 287.2 [ $\text{M-OctOSO}_3^-$ ] $^+$ ; MS:  $m/z$ , 209.1 [ $\text{OctOSO}_3^-$ ]

### **2,3-Dimethyl-1-(butoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (13f)**

The title compound was prepared from 2,3-dimethyl-1-(butoxycarbonylmethyl)imidazolium bromide (**13a**) (2.51 g, 7.50 mmol) and sodium octyl sulphate (1.51 g, 6.50 mmol) according to the general procedure in 84 % yield (2.53 g, 5.44 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 7.49 (d,  $J = 2.2$  Hz, 1H), 7.43 (d,  $J = 2.2$  Hz, 1H), 5.20 (s, 2H), 4.36 (t,  $J = 4.7$  Hz, 2H), 3.88 (m, 5H), 3.67 (t,  $J = 4.7$  Hz, 2H), 3.48 (t,  $J = 6.8$  Hz, 2H), 2.63 (s, 3H), 1.68-1.55 (m, 4H), 1.42-1.27 (m, 12H), 0.96 (t,  $J = 7.4$  Hz, 3H), 0.90 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 166.52, 145.81, 122.70, 122.40, 71.22, 67.99, 67.82, 65.57, 49.37, 35.57, 31.84, 31.62, 29.49, 29.36, 29.28, 25.87, 22.67, 19.24, 14.13, 13.94, 10.20

Mp ( $^{\circ}\text{C}$ ) 50 – 52

IR (KBr disc) ( $\text{cm}^{-1}$ ) 2959, 2927, 2861, 1751, 1558, 1546, 1539, 1495, 1455, 1256, 1217, 1121

MS  $m/z$ , 255.3 [ $\text{M-OctOSO}_3^-$ ] $^+$ ; MS:  $m/z$ , 209.1 [ $\text{OctOSO}_3^-$ ]

### **2,3-Dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (14f)**

The title compound was prepared from 2,3-dimethyl-1-(methoxyethoxyethoxycarbonylmethyl)imidazolium bromide (**14a**) (2.56 g, 7.60 mmol) and sodium octyl sulphate (1.62 g, 7.00 mmol) according to the general procedure in 94 % yield (3.07 g, 6.57 mmol).

### **2,3-Dimethyl-1-(pentoxycarbonylmethyl)imidazolium OctSO<sub>4</sub> (15f)**

The title compound was prepared from 2,3-dimethyl-1-(pentoxycarbonylmethyl)imidazolium bromide (**15a**) (2.47 g, 8.10 mmol) and sodium octyl sulphate (1.65 g, 7.10 mmol) according to the general procedure in 86 % yield (2.66 g, 6.11 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 7.44 (d, *J* = 2.4 Hz, 1H), 7.36 (d, *J* = 2.4 Hz, 1H), 5.13 (s, 2H), 4.12 (t, *J* = 6.8 Hz, 2H), 3.88 (t, *J* = 7.0 Hz, 2H), 3.81 (s, 3H), 2.57 (s, 3H), 1.64-1.53 (m, 4H), 1.28-1.18 (m, 14H), 0.86 (t, *J* = 7.0 Hz, 3H), 0.82 (t, *J* = 7.0 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 166.55, 145.82, 122.71, 122.31, 67.59, 66.93, 49.55, 35.64, 31.84, 29.54, 29.37, 29.28, 28.07, 27.83, 25.90, 22.67, 22.24, 14.13, 13.94, 10.45

Mp = 63 – 65 °C

IR cm<sup>-1</sup> 2956, 2927, 1751, 1452, 1398, 1251, 1219, 1052

MS: *m/z*, 225.2 [M-OctSO<sub>4</sub>]<sup>+</sup>; MS: *m/z*, 209.1 [OctSO<sub>4</sub>]<sup>-</sup>

## Alkylating agents

### **Butyl 2-bromoacetate**

The title compound was prepared from butan-1-ol (34.04 g, 460 mmol) and bromoacetyl bromide (92.92 g, 460 mmol) according to the general procedure in 68 % yield (61.00 g, 313 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 4.10 (t,  $J = 6.7$  Hz, 2H), 3.75 (s, 2H), 1.60 (tt,  $J = 6.7, 7.2$  Hz, 2H), 1.36 (tq,  $J = 7.2, 7.4$  Hz, 2H), 0.95 (t,  $J = 7.4$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.38, 66.19, 30.42, 26.00, 19.00, 13.67

### **Pentyl 2-bromoacetate**

The title compound was prepared from pentan-1-ol (44.00 g, 500 mmol) and bromoacetyl bromide (101.00 g, 500 mmol) according to the general procedure in 64 % yield (66.88 g, 320 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 4.09 (t,  $J = 6.8$  Hz, 2H), 3.75 (s, 2H), 1.61-1.54 (m, 2H), 1.28-1.23 (m, 4H), 0.84 (t,  $J = 7.0$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.35, 66.45, 28.09, 27.87, 26.01, 22.27, 13.94

### **2-Methoxyethyl 2-bromoacetate**

The title compound was prepared from methoxyethanol (34.96 g, 460 mmol) and bromoacetyl bromide (92.92 g, 460 mmol) according to the general procedure in 70 % yield (63.43 g, 322 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 4.27 (t,  $J = 4.6$  Hz, 2H), 3.82 (s, 2H), 3.56 (t,  $J = 4.6$  Hz, 2H), 3.33 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.23, 69.99, 65.17, 58.97, 25.86

### **2-Ethoxyethyl 2-bromoacetate**

The title compound was prepared from ethoxyethanol (45.00 g, 500 mmol) and bromoacetyl bromide (101.00, 500 mmol) according to the general procedure in 60 % yield (63.30 g, 300 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 4.27 (t,  $J = 4.7$  Hz, 2H), 3.83 (s, 2H), 3.61 (t,  $J = 4.7$  Hz, 2H), 3.50 (q,  $J = 7.1$  Hz, 2H), 1.17 (t,  $J = 7.1$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.34, 67.95, 66.75, 65.47, 25.91, 15.10

### **2-Propoxyethyl 2-bromoacetate**

The title compound was prepared from propoxyethanol (47.84 g, 460 mmol) and bromoacetyl bromide (92.92 g, 460 mmol) according to the general procedure in 83 % yield (85.91 g, 382 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 4.34 (t,  $J = 4.6$  Hz, 2H), 3.88 (s, 2H), 3.67 (t,  $J = 4.6$  Hz, 2H), 3.47 (t,  $J = 6.9$  Hz, 2H), 1.66 (tq,  $J = 6.9, 7.3$  Hz, 2H), 0.94 (t,  $J = 7.3$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.31, 73.07, 68.10, 65.42, 25.90, 22.81, 10.52

### **2-Butoxyethyl 2-bromoacetate**

The title compound was prepared from butoxyethanol (54.28 g, 460 mmol) and bromoacetyl bromide (92.92 g, 460 mmol) according to the general procedure in 75 % yield (82.46 g, 345 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 4.32 (t,  $J = 4.6$  Hz, 2H), 3.88 (s, 2H), 3.65 (t,  $J = 4.6$  Hz, 2H), 3.47 (t,  $J = 6.8$  Hz, 2H), 1.61 (tt,  $J = 6.8, 7.1$  Hz, 2H), 1.43 (tq,  $J = 7.1, 7.4$  Hz, 2H), 0.92 (t,  $J = 7.4$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.27, 71.19, 68.12, 65.39, 31.57, 25.87, 19.20, 13.88

### **2-(2-Methoxyethoxy)ethyl 2-bromoacetate**

The title compound was prepared from methoxyethoxyethanol (54.00 g, 450 mmol) and bromoacetyl bromide (90.90 g, 450 mmol) according to the general procedure in 62 % yield (67.24 g, 279 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 4.31 (t,  $J = 4.6$  Hz, 2H), 3.86 (s, 2H), 3.71 (t,  $J = 4.6$  Hz, 2H), 3.63-3.62 (m, 2H), 3.53-3.51 (m, 2H), 3.34 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.24, 71.81, 70.52, 68.75, 65.27, 59.07, 25.91

### **2-(2-Ethoxyethoxy)ethyl 2-bromoacetate**

The title compound was prepared from ethoxyethoxyethanol (20.10 g, 150 mmol) and bromoacetyl bromide (40.40 g, 200 mmol) according to the general procedure in 61 % yield (23.33 g, 91.4 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 4.34 (t, *J* = 4.6 Hz, 2H), 3.88 (s, 2H), 3.74 (t, *J* = 4.6 Hz, 2H), 3.66 (t, *J* = 4.0 Hz, 2H), 3.60 (t, *J* = 4.0 Hz, 2H), 3.53 (q, *J* = 6.9 Hz, 2H), 1.22 (t, *J* = 6.9 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.27, 71.20, 70.45, 69.90, 66.72, 65.32, 25.90, 15.15

### **2-(2-Propoxyethoxy)ethyl 2-bromoacetate**

The title compound was prepared from propoxyethoxyethanol (68.08 g, 460 mmol) and bromoacetyl bromide (92.92 g, 460 mmol) according to the general procedure in 73 % yield (90.33 g, 336 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 4.36 (t, *J* = 4.2 Hz, 2H), 3.89 (s, 2H), 3.77 (t, *J* = 4.2 Hz, 2H), 3.70 (t, *J* = 4.4 Hz, 2H), 3.63 (t, *J* = 4.4 Hz, 2H), 3.59 (t, *J* = 7.1 Hz, 2H), 3.56 (tq, *J* = 7.1, 7.3 Hz, 2H), 1.26 (t, *J* = 7.3 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.27, 73.13, 70.67, 70.56, 68.76, 65.36, 25.88, 22.74, 10.51

### **2-(2-Butoxyethoxy)ethyl 2-bromoacetate**

The title compound was prepared from butoxyethoxyethanol (72.9 g, 450 mmol) and bromoacetyl bromide (90.9 g, 450 mmol) according to the general procedure in 72 % yield (91.69 g, 324 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 4.30 (t, *J* = 4.6 Hz, 2H), 3.85 (s, 2H), 3.71 (t, *J* = 4.6 Hz, 2H), 3.62-3.58 (m, 2H), 3.56-3.51 (m, 2H), 3.43 (t, *J* = 6.8 Hz, 2H), 1.54 (tt, *J* = 6.8, 7.2 Hz, 2H), 1.34 (tq, *J* = 7.2, 7.5 Hz, 2H), 0.89 (t, *J* = 7.5 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.28, 71.32, 71.21, 70.68, 68.76, 65.37, 31.68, 25.89, 19.24, 13.95

### **2-(2-(2-Methoxyethoxy)ethoxy)ethyl 2-bromoacetate**

The title compound was prepared from methoxyethoxyethoxyethanol (29.52 g, 180 mmol) and bromoacetyl bromide (10.4 g, 200 mmol) according to the general procedure in 58 % yield (29.75 g, 104 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 4.28 (t,  $J = 4.6$  Hz, 2H), 3.81 (s, 2H), 3.68 (t,  $J = 4.6$  Hz, 2H), 3.62-3.57 (m, 6H), 3.50-3.43 (m, 2H), 3.32 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.25, 71.91, 70.64, 70.57, 70.52, 68.74, 65.31, 59.04, 25.84

### **Decyl 2-bromoacetate**

The title compound was prepared from decan-1-ol (71.10 g, 450 mmol) and bromoacetyl bromide (90.90 g, 450 mmol) according to the general procedure in 62 % yield (77.84 g, 279 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 4.18 (t,  $J = 6.8$  Hz, 2H), 3.85 (s, 2H), 1.90 – 1.28 (m, 16H), 0.89 (t,  $J = 6.8$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 167.37, 66.49, 63.05, 34.09, 32.85, 32.77, 29.52, 29.49, 29.35, 29.19, 22.69, 14.13



## Amide IIs

### Bromide salts

#### **3-Methyl-1-(pyrrolidinylcarbonylmethyl)imidazolium bromide (16a)**

The title compound was prepared from 1-methylimidazole (36.0 mmol, 2.95 g) and 2-bromo-1-(pyrrolidin-1-yl)ethanone (39.0 mmol, 7.49 g) according to the general procedure in 56 % yield (5.52 g, 20.15 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.80 (s, 1H), 7.71 (t,  $J = 1.8$  Hz, 1H), 7.46 (t,  $J = 1.8$  Hz, 1H), 5.58 (s, 2H), 4.02 (s, 3H), 3.65 (t,  $J = 6.8$  Hz, 2H), 3.42 (t,  $J = 6.8$  Hz, 2H), 2.04 (tt,  $J = 6.8, 7.2$  Hz, 2H), 1.86 (tt,  $J = 6.8, 7.2$  Hz, 2H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 162.63, 137.95, 124.41, 122.32, 51.09, 46.55, 46.11, 36.76, 25.98, 24.04

MP ( $^\circ\text{C}$ ) 109 – 111

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3443, 1656, 1573, 1424, 1343, 1176, 1042

MS  $m/z$ , 194.1289  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{10}\text{H}_{16}\text{N}_3\text{O}$  194.1293

MS  $m/z$ , 194.1  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

#### **2,3-Dimethyl-1-(pyrrolidinylcarbonylmethyl)imidazolium bromide (17a)**

The title compound was prepared from 1,2-dimethylimidazole (40.0 mmol, 3.84 g) and 2-bromo-1-(pyrrolidin-1-yl)ethanone (42.0 mmol, 8.06 g) according to the general procedure in 82 % yield (9.41 g, 32.8 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 7.84 (d,  $J = 2.2$  Hz, 1H), 7.47 (d,  $J = 2.2$  Hz, 1H), 5.66 (s, 2H), 3.91 (s, 3H), 3.76 (t,  $J = 6.8$  Hz, 2H), 3.46 (t,  $J = 6.8$  Hz, 2H), 2.72 (s, 3H), 2.05 (tt,  $J = 6.8, 6.4$  Hz, 2H), 1.92 (tt,  $J = 6.8, 6.4$  Hz, 2H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 162.51, 146.06, 123.04, 121.70, 51.16, 46.50, 46.18, 35.80, 26.01, 24.05, 11.15

MP ( $^\circ\text{C}$ ) 142 – 144

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3406, 3141, 1646, 1478, 1420, 1337, 1165

MS  $m/z$ , 208.1441  $[\text{M}-\text{Br}^-]^+$ , Calcd.  $\text{C}_{11}\text{H}_{18}\text{N}_3\text{O}$  208.1450

MS  $m/z$ , 208.1  $[\text{M}-\text{Br}^-]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

#### **3-Methyl-1-(methoxyethylcarbonylmethyl)imidazolium bromide (18a)**

The title compound was prepared from 1-methylimidazole (50.0 mmol, 4.10 g) and 2-bromo-*N*-(2-methoxyethyl)acetamide (56.0 mmol, 10.98 g) according to the general procedure in 97 % yield (13.48 g, 48.5 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.76 (s, 1H), 8.55 (t,  $J = 5.2$  Hz, 1H), 7.65 (t,  $J = 1.6$  Hz, 1H), 7.31 (t,  $J = 1.6$  Hz, 1H), 5.39 (s, 2H), 4.05 (s, 3H), 3.56-3.53 (m, 2H), 3.48-3.44 (m, 2H), 3.36 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 164.74, 137.73, 123.90, 122.44, 70.40, 58.69, 51.75, 39.51, 36.80

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3064, 1683, 1559, 1456, 1261, 1177, 1122, 1022

MS  $m/z$ , 198.1238  $[\text{M}-\text{Br}]^+$ , Calcd.  $\text{C}_9\text{H}_{16}\text{N}_3\text{O}_2$  198.1243

MS  $m/z$ , 198.1  $[\text{M}-\text{Br}]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-(methoxypropylcarbonylmethyl)imidazolium bromide (19a)**

The title compound was prepared from 1-methylimidazole (43.0 mmol, 3.53 g) and 2-bromo-*N*-(3-methoxypropyl)acetamide (46.0 mmol, 9.66 g) according to the general procedure in 91 % yield (11.43 g, 39.1 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.66 (s, 1H), 8.53 (t,  $J = 5.4$  Hz, 1H), 7.65 (t,  $J = 1.8$  Hz, 1H), 7.41 (t,  $J = 1.8$  Hz, 1H), 5.33 (s, 2H), 4.04 (s, 3H), 3.42 (t,  $J = 6.3$  Hz, 2H), 3.34-3.26 (m, 5H), 1.83 (tt,  $J = 6.3, 6.8$  Hz, 2H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 164.43, 137.49, 123.77, 122.76, 70.16, 58.62, 51.73, 37.25, 36.83, 29.08

MP ( $^\circ\text{C}$ ) 75 – 77

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3440, 3081, 2939, 1684, 1567, 1447, 1264, 1178, 1112

MS  $m/z$ , 212.1395  $[\text{M}-\text{Br}]^+$ , Calcd.  $\text{C}_{10}\text{H}_{18}\text{N}_3\text{O}_2$  212.1399

MS  $m/z$ , 212.1  $[\text{M}-\text{Br}]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **3-Methyl-1-[(bis-1-methoxyethyl)carbonylmethyl]imidazolium bromide (20a)**

The title compound was prepared from 1-methylimidazole (45.0 mmol, 3.69 g) and 2-bromo-*N,N*-bis-(2-methoxyethyl)acetamide (50.0 mmol, 12.70 g) according to the general procedure in 91 % yield (13.76 g, 41.0 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.91 (s, 1H), 7.44 (t,  $J = 1.8$  Hz, 1H), 7.42 (t,  $J = 1.8$  Hz, 1H), 5.66 (s, 2H), 4.07 (s, 3H), 3.70 (t,  $J = 4.8$  Hz, 2H), 3.57-3.55 (m, 4H), 3.50-3.47(m, 2H), 3.36 (s, 3H), 3.31 (s, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.46, 138.30, 124.14, 122.31, 70.51, 70.05, 59.25, 58.92, 50.63, 48.82, 46.83, 36.75

MP ( $^\circ\text{C}$ ) 68 – 70

IR (KBr disc) ( $\text{cm}^{-1}$ ) 3441, 3108, 2940, 1654, 1576, 1474, 1427, 1178, 1116, 1015

MS  $m/z$ , Found 256.1653  $[\text{M}-\text{Br}]^+$ , Calcd.  $\text{C}_{12}\text{H}_{22}\text{N}_3\text{O}_3$  256.1661

MS  $m/z$ , 256.2  $[\text{M}-\text{Br}]^+$ ; MS:  $m/z$ , 79 and 81  $[\text{Br}^-]$

### **Octyl sulfate salts**

#### **3-Methyl-1-(pyrrolidinylcarbonylmethyl)imidazolium OctSO<sub>4</sub> (16f)**

The title compound was prepared from 3-methyl-1-(pyrrolidinylcarbonylmethyl)imidazolium bromide (**16a**) (7.7 mmol, 2.11 g) and sodium octyl sulphate (8.0 mmol, 1.86 g) according to the general procedure in 97 % yield (3.02 g, 7.48 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 9.53 (s, 1H), 7.45 (t, *J* = 1.8 Hz, 1H), 7.20 (t, *J* = 1.8 Hz, 1H), 5.34 (s, 2H), 3.92 (m, 5H), 3.57 (t, *J* = 6.8 Hz, 2H), 3.40 (t, *J* = 6.8 Hz, 2H), 1.99 (tt, *J* = 6.8, 6.8 Hz, 2H), 1.86 (tt, *J* = 6.8, 6.8 Hz, 2H), 1.61 (tt, *J* = 6.8, 7.4 Hz, 2H), 1.29-1.19 (m, 10H), 0.82 (t, *J* = 7.0 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 162.66, 138.56, 124.32, 122.10, 67.97, 50.84, 46.57, 46.02, 36.58, 31.83, 29.51, 29.36, 29.27, 26.03, 25.87, 24.07, 22.67, 14.14

IR (thin film on salt plate) (cm<sup>-1</sup>) 3460, 2922, 1652, 1471, 1218, 1089, 979

MS *m/z*, 194.2 [M-OctOSO<sub>3</sub><sup>-</sup>]<sup>+</sup>; MS: *m/z*, 209.0 [OctOSO<sub>3</sub><sup>-</sup>]

#### **2,3-Dimethyl-1-(pyrrolidinylcarbonylmethyl)imidazolium OctSO<sub>4</sub> (17f)**

The title compound was prepared from 2,3-dimethyl-1-(pyrrolidinylcarbonylmethyl)imidazolium bromide (**17a**) (7.5 mmol, 2.15 g) and sodium octyl sulphate (8.0 mmol, 1.86 g) according to the general procedure in 98 % yield (3.06 g, 7.34 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 7.52 (d, *J* = 2.0 Hz, 1H), 7.31 (d, *J* = 2.0 Hz, 1H), 5.32 (s, 2H), 3.62 (t, *J* = 6.8 Hz, 2H), 3.82 (s, 3H), 3.38 (t, *J* = 6.8 Hz, 2H), 3.40 (t, *J* = 7.0 Hz, 2H), 2.65 (s, 3H), 1.20 (tt, *J* = 6.8, 7.2 Hz, 2H), 1.85 (tt, *J* = 6.8, 7.2 Hz, 2H), 1.60 (tt, *J* = 6.8, 7.4 Hz, 2H), 1.26-1.15 (m, 10H), 0.82 (t, *J* = 6.8 Hz, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 162.79, 145.99, 122.88, 121.79, 67.75, 50.58, 46.47, 45.92, 35.50, 31.82, 29.53, 29.37, 29.27, 26.03, 25.89, 24.07, 22.66, 14.13, 10.52

IR (thin film on salt plate) (cm<sup>-1</sup>) 3460, 2920, 2853, 1651, 1468, 1216, 1116, 1085

MS *m/z*, 208.1 [M-OctOSO<sub>3</sub><sup>-</sup>]<sup>+</sup>; MS: *m/z*, 209.0 [OctOSO<sub>3</sub><sup>-</sup>]

#### **3-Methyl-1-[bis-1-methoxyethyl]carbonylmethyl)imidazolium OctSO<sub>4</sub> (20f)**

The title compound was prepared from 3-methyl-1-[(*bis*-1-methoxyethyl)carbamylmethyl]imidazolium bromide (1.38 g, 4.1 mmol) (**20a**) and sodium octyl sulphate (4.0 mmol, 0.93 g) according to the general procedure in 92 % yield (1.71 g, 3.67 mmol).

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 9.34 (s, 1H), 7.25 (t,  $J = 1.6$  Hz, 1H), 7.20 (t,  $J = 1.6$  Hz, 1H), 5.30 (s, 2H), 3.98 (t,  $J = 6.8$  Hz, 2H), 3.91 (s, 3H), 3.60 (t,  $J = 4.8$  Hz, 2H), 3.51-3.43 (m, 6H), 3.30 (s, 3H), 3.26 (s, 3H), 1.63 (tt,  $J = 6.8, 7.2$  Hz, 2H), 1.30-1.19 (m, 10H), 0.82 (t,  $J = 6.8$  Hz, 3H)

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  (ppm) 165.64, 139.03, 124.03, 122.17, 70.54, 70.03, 67.91, 59.17, 58.91, 50.43, 48.62, 46.77, 36.47, 31.83, 29.51, 29.36, 29.27, 25.87, 22.67, 14.13

IR (thin film on salt plate) ( $\text{cm}^{-1}$ ) 3480, 3112, 2926, 1653, 1575, 1472, 1428, 1220, 1119, 1016

MS  $m/z$ , 256.1 [ $\text{M-OctOSO}_3^-$ ] $^+$ ; MS:  $m/z$ , 209.0 [ $\text{OctOSO}_3^-$ ]

## Alkylating agents

### **2-Bromo-*N,N*-bis(2-methoxyethyl)acetamide**

The title compound was prepared from bis(2-methoxyethyl)amine (39.90 g, 300 mmol) and bromoacetyl bromide (80.80 g, 400 mmol) according to the general procedure in 49 % yield (37.33 g, 147 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 4.02 (s, 2H), 3.66 (t, *J* = 5.1 Hz, 2H), 3.55 (br s, 4H), 3.53 (t, *J* = 5.1 Hz, 2H), 3.33 (s, 6H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 167.79, 70.74, 70.27, 59.13, 58.94, 50.12, 46.90, 27.20

### **2-Bromo-1-(pyrrolin-1-yl)ethanone**

The title compound was prepared from pyrrolidine (33.50 g, 500 mmol) and bromoacetyl bromide (121.20 g, 600 mmol) according to the general procedure in 52 % yield (49.92 g, 260 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 3.82 (s, 2H), 3.55 (tt, *J* = 6.8, 6.8 Hz, 4H), 2.00 (tt, *J* = 6.8, 6.8 Hz, 2H), 1.92 (tt, *J* = 6.8, 6.8 Hz, 2H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.26, 47.15, 46.54, 27.30, 26.13, 24.32

### **2-Bromo-*N*-(2-methoxyethyl)acetamide**

The title compound was prepared from 2-methoxyethylamine (37.5 g, 500 mmol) and bromoacetyl bromide (111.10 g, 550 mmol) according to the general procedure in 17 % yield (16.66 g, 85.0 mmol).

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 6.80 (br s, 1H), 3.90 (s, 2H), 3.49 (s, 2H), 3.48 (s, 2H), 3.39 (s, 3H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.60, 70.68, 58.89, 39.93, 29.12

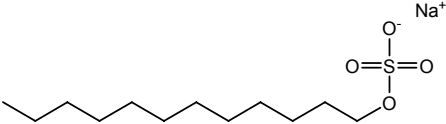
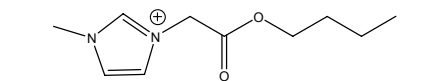
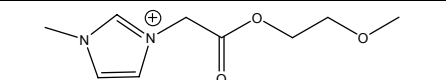
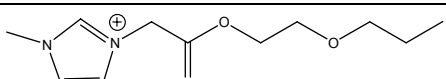
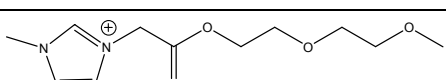
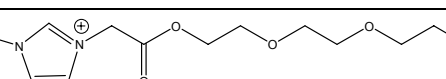
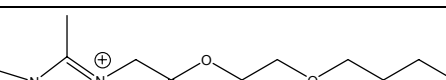
### **2-Bromo-*N*-(3-methoxypropyl)acetamide**

The title compound was prepared from 3-methoxypropan-1-amine (44.5 g, 500 mmol) and bromoacetyl bromide (111.10 g, 550 mmol) according to the general procedure in 51 % yield (53.55 g, 255 mmol).

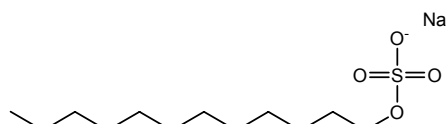
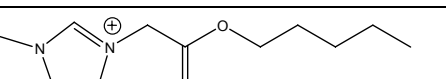
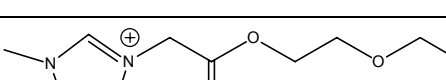
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ (ppm) 7.22 (br s, 1H), 3.81 (s, 2H), 3.45 (t, *J* = 5.6 Hz, 2H), 3.37 (q, 6.2 Hz, 2H), 3.30 (s, 3H), 1.78 (tt, *J* = 5.6, 6.2 Hz, 2H)

<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (ppm) 165.39, 71.87, 58.86, 39.21, 29.33, 28.47

### Biodegradation results

IL number	Octyl sulphate salt	0	7	15	21	28
		Days				
SDS Ref		0	81	85	90	92
1f		0	45	54	56	59
3f		0	54	59	59	59
5f		0	51	58	61	65
7f		0	32	56	58	58
9f		0	42	62	63	66
13f		0	53	54	62	65

### CO<sub>2</sub> Headspace test results

IL Number	Octyl sulphate salt	0	7	14	21	28
		Days				
SDS		0	78	87	90	90
2f		0	52	59	60	64
4f		0	54	57	59	57



