Electronic Supporting Information:

Cellulose solubilities in carboxylate-based ionic liquids

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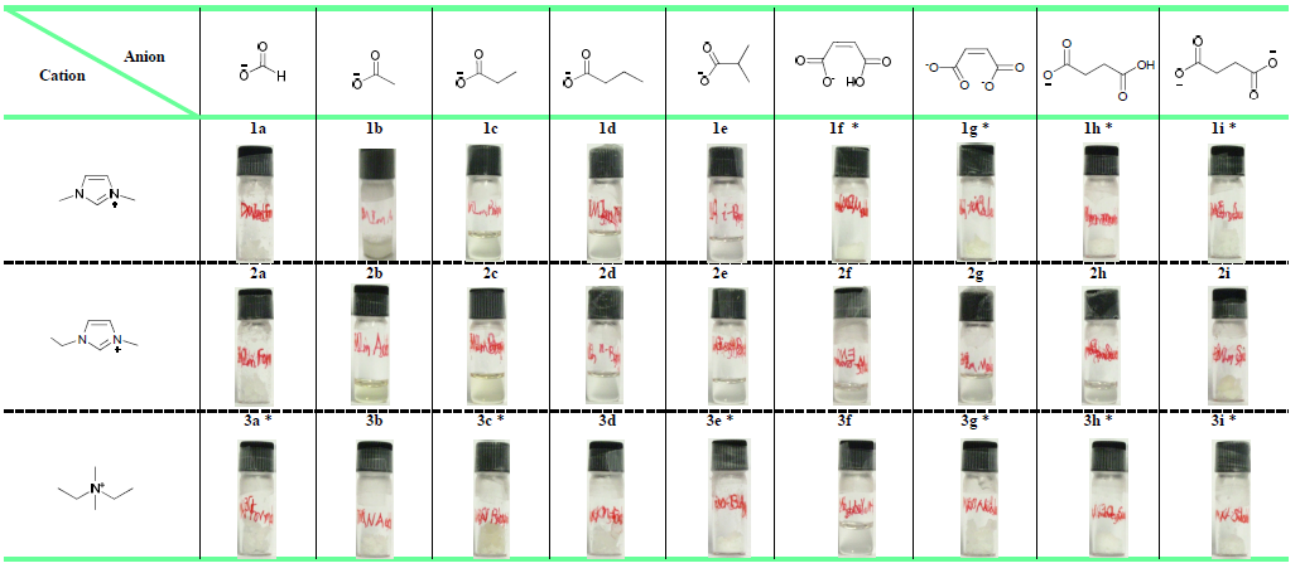
Table 1 The water content of ionic liquids before dissolving cellulose

IL	1a	1b	1c	1d	1f	2a	2b	2c	2d
Water content / ppm	-	-	2089	1880	2141	-	1262	2047	2666
IL	2e	2f	2g	2h	2i	3b	3d	3f	
Water content / ppm	3257	*	*	*	-	-	-	1806	

- They are solid, no water content.
* No water conent, due to the high viscosity.

Table 2 Appearance of synthesized carboxylate-based structures



* Not IL as m.p. > 373 K

Expermental details and characterisation of carboxylate-based structures:

To get the intermediate 1,3-dimethylimidazolium-2-carboxylate, a few modifications was made according to the literature[J. D. Holbrey, W. M. Reichert, I. Tkatchenko, E. Bouajila, O. Walter, I. Tommasi, R. D. Rogers, *Chemical Communications* **2003**, 28.]. 10 mL 1,3-dimethylimidazole, 15 mL dimethylcarbonate and 20 mL methanol were added into a 75 mL autoclave, then heated up to 373 K for 24 h. After removing low boiling point compounds in vacuum and washing with acetone, 10.5 g the pure intermediate 1,3-dimethylimidazolium-2-carboxylate was obtained, yield: 59.7 %. Generally, 2.8 g intermediate was dissolved with 20 mL water or ethanol-water (10 mL-10 mL) as solvent, then 20 mmol carboxylic acid was added. At 343 K, the solution was stirred over 3 hours. After removal of the solvent, pure product was obtained quantitatively.

1,3-Dimethylimidazolium-2-carboxylate
^{1}H-NMR(400 MHz; D_2O; δ/ppm) : 3.97 (s, 6H, NCH_3), 7.35 (s, 2H, NCHCHN). It conforms the literature.

1,3-Dimethylimidazolium formate 1a : ^{1}H-NMR(400 MHz; DMSO-d_6; δ/ppm): 3.86 (s, 6H, NCH_3), 7.79 (d, ^{3}J(H,H)=1.6 Hz, 2H, NCHCHN), 8.60 (s, 1H, HCOO), 9.70 (s, 1H, NCHN)

^{13}C-NMR(100 MHz; DMSO-d_6; δ/ppm): 35.43 (NCH_3), 123.38 (NCHCHN), 137.76 (NCHN), 165.47 (HCOO).

1,3-Dimethylimidazolium acetate 1b : ^{1}H-NMR(400 MHz; DMSO-d_6; δ/ppm) : 1.57 (s, 3H, $OOCCH_3$), 3.83 (s, 6H, NCH_3), 7.80 (d, 3J(H,H)=1.6 Hz, 2H, NCHCHN), 10.02(1H, s, NCHN).
^{13}C-NMR(100 MHz; DMSO-d_6; δ/ppm): 26.23 ($OOCCH_3$), 35.35 (NCH_3), 123.34 (NCHCHN), 138.27 (NCHN), 173.08 (CH_3COO).

1,3-Dimethylimidazolium propionate 1c : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 0.87 (t, ^{3}J(H,H)=7.6 Hz, 3H, CH_2CH_3), 1.82 (q, 3J(H,H)=7.6 Hz, ^{3}J=11.4 Hz, 2H, CH_3CH_2), 3.87 (s, 6H, NCH_3), 7.84 (s, 2H, NCHCHN), 10.17 (1H, s, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 11.49 (CH_2CH_3), 31.67 (CH_3CH_2), 35.30 (NCH_3), 123.34 (NCHCHN), 138.45 (NCHN), 176.42 (CH_2COO).

1,3-Dimethylimidazolium butyrate 1d : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 0.79 (t, ^{3}J(H,H)=7.2 Hz, 3H, CH_3CH_2), 1.40 (m, 2H, CH_2CH_3), 1.79 (t, ^{3}J(H,H)=7.2 Hz, 2H, CH_2CH_2), 3.87 (s, 6H, NCH_3), 7.76 (d, ^{3}J(H,H)=1.6 Hz, 2H, NCHCHN), 10.14 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 14.56 (CH_2CH_3), 19.87 (CH_3CH_2), 35.40 (NCH_3), 41.35 ($OOCCH_2$), 123.32 (NCHCHN), 138.22 (NCHN), 175.29 (CH_2COO).

1,3-Dimethylimidazolium *iso*-butyrate 1e : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 0.90 (d, ^{3}J(H,H)=6.8 Hz, 6H, $CH(CH_3)_2$), 1.97 (septet, ^{3}J(H,H)=6.8 Hz, 1H, CHCOO), 3.87 (s, 6H, NCH_3), 7.80 (d, ^{3}J(H,H)=1.6 Hz, 2H, NCHCHN), 10.14 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 20.98 ($CH(CH_3)_2$), 35.35 (NCH_3), 36.80 ($(CH_3)_2CH$), 123.33 (NCHCHN), 138.46 (NCHN), 179.02 (CHCOO).

1,3-Dimethylimidazolium *mono*-maleate 1f : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 3.85 (s, 6H, NCH_3), 6.02 (s, 2H, CHCH), 7.68 (s, 2H, NCHCHN), 9.05 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 35.66 (NCH_3), 123.45 (NCHCHN), 136.17 (CHCH), 137.07 (NCHN), 167.21 (CHCOO).

Bis(1,3-dimethylimidazolium) maleate 1g : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm): 3.89 (s, 12H, NCH_3), 5.46 (s, 2H, CHCH), 7.72 (s, 4H, NCHCHN), 9.98 (s, 2H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 35.41 (NCH_3), 123.10 (NCHCHN), 130.56 (CHCH), 139.12 (NCHN), 171.18 (CHCOO).

1,3-Dimethylimidazolium *mono*-succinate 1h : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm): 2.23 (s, 4H, CH_2CH_2), 3.85 (s, 6H, NCH_3), 7.69 (s, 2H, NCHCHN), 9.08 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 32.91 (CH_2CH_2), 35.65 (NCH_3), 123.45 (NCHCHN), 137.11 (NCHN), 175.38 (CH_2COO).

Bis(1,3-dimethylimidazolium) succinate 1i : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm): 1.97 (s, 4H, CH_2CH_2), 3.87 (s, 12H, NCH_3), 7.75 (s, 4H, NCHCHN), 9.99 (s, 2H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 35.45 (NCH_3), 37.00 (CH_2CH_2), 123.32 (NCHCHN), 138.42 (NCHN), 176.81 (CH_2COO).

According to the method of synthesizing 1,3-dimethylimidazolium carboxylate and the literautre[C. Rijksen, R. D. Rogers, *The Journal of Organic Chemistry* **2008**, *73*, 5582 & B. Bantu, G. M. Pawar, K. Wurst, U. Decker, A. M. Schmidt, M. R. Buchmeiser, *European Journal of Inorganic Chemistry* **2009**, *2009*, 1970], 1-ethyl-3-methylimidazolium carboxylate was prepared. The procedure is: 10 mL 1-ethylimidazole, 20 mL dimethylcarbonate, and 20 mL methanol were added into a 75 mL autoclave. Then the solution was heated up to 393 K for 24 hours. After reaction, the solvent was removed with reduced pressure (keep it less than 40 ^{o}C). After washing with acetone (10 mL ×3), the intermediate 1-ethyl-3-methylimidazolium-2-carboxylate was obtained, 8.1 g, yield: 50.5 %. Then 3.08 g intermediate was dissolved with 20 mL water or ethanol-water (10 mL-10 mL) as solvent, then 20 mmol carboxylic acid was added. At 343 K, the solution was stirred over 3 hours. After removal of the solvent, pure product was obtained quantitatively. Target molecules also can be prepared by replacing the intermediate with another compound, 1-ethyl-3-methylimidazolium hydrogen carbonate.

1-Ethyl-3-methylimidazolium-2-carboxylate
^{1}H-NMR (400 MHz; D_2O; δ/ppm) : 1.40 (t, ^{3}J(H,H)=7.2 Hz, 3H, CH_2CH_3), 3.92 (s, 3H, NCH_3), 4.37 (d, ^{3}J(H,H)=7.2 Hz, 2H, NCH_2), 7.35 (d, ^{3}J(H,H)=1.6 Hz, 1H, NCH), 7.41 (d, ^{3}J(H,H)=1.6 Hz, 1H, NCH).
^{13}C-NMR (100 MHz; D_2O; δ/ppm): 15.04 (CH_2CH_3), 36.43 (NCH_3), 45.07 (NCH_2), 121.19 (NCH), 123.12 (NCH), 139.57 (NCHN), 158.33 (CHCOO).

1-Ethyl-3-methylimidazolium hydrogen carbonate
1-Ethyl-3-methylimidazolium-2-carboxylate was dissolved in water, stirred at 313 K overnight. After removing water under reduced pressure and washing with acetone, pure product 1-ethyl-3-methylimidazolium hydrogen carbonate was obtained.
^{1}H-NMR (400 MHz; D_2O; δ/ppm) : 1.43 (t, ^{3}J(H,H)=7.2 Hz, 2H, NCH_2), 3H, CH_2CH_3), 3.82 (s, 3H, NCH_3), 4.15 (d, ^{3}J(H,H)=7.2 Hz, 2H, NCH_2), 2H, NCH_2), 7.35 (d, ^{3}J(H,H)=1.6 Hz, 1H, NCH), 7.42 (d, ^{3}J(H,H)=1.6 Hz, 1H, NCH), 8.65 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; D_2O; δ/ppm): 14.38 (CH_2CH_3), 35.47 (NCH_3), 44.66 (NCH_2), 121.73 (NCH), 123.32 (NCH), 160.17 (HOCOO).

1-Ethyl-3-methylimidazolium formate 2a : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.39 (t, ^{3}J(H,H)=7.2 Hz, 3H, CH_2CH_3), 3.87 (s, 3H, NCH_3), 4.21 (q, ^{3}J(H,H)=7.2 Hz, 2H, CH_3CH_2), 7.82 (s, 1H, NCH), 7.92 (s, 1H, NCH), 8.63 (s, 1H, HCOO), 9.86 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 15.19 (CH_2CH_3), 35.53 (NCH_3), 43.97 (NCH_2), 122.04 (NCH), 123.57 (NCH), 137.16 (NCHN), 165.49 (HCOO).

1-Ethyl-3-methylimidazolium acetate 2b : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.38 (t, ^{3}J(H,H)=7.2 Hz, 3H, CH_2CH_3), 1.58 (s, 3H, $OOCCH_3$), 3.89 (s, 3H, NCH_3), 4.23 (q, ^{3}J(H,H)=7.2 Hz, 2H, CH_3CH_2), 7.90 (d, ^{3}J(H,H)=1.6 Hz, 1H, NCH), 8.01 (d, ^{3}J(H,H)=1.6 Hz, 1H, NCH), 10.37 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 15.27 (CH2CH3), 26.29 (OOCCH3), 35.37 (NCH3), 43.85 (NCH2), 122.08 (NCH), 123.58 (NCH), 137.95 (NCHN), 173.42 (CH3COO).

1-Ethyl-3-methylimidazolium propionate 2c : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 0.87 (t, ^{3}J(H,H)=7.6 Hz, 3H, CH_2CH_3), 1.40 (t, ^{3}J(H,H)=7.2 Hz, 3H, NCH_2CH_3), 1.79 (q, ^{3}J(H,H)=7.6 Hz, 2H, $OOCCH_2$), 3.88 (s, 3H, NCH_3), 4.22 (q, ^{3}J(H,H)=7.2 Hz, 2H, CH_3CH_2), 7.78 (s, 1H, NCH), 7.88 (s, 1H, NCH), 10.11 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 11.60 (CH_2CH_3), 15.27 (NCH_2CH_3), 31.75 ($OOCCH_2$), 35.47 (NCH_3), 43.91 (NCH_2), 121.92 (NCH), 123.47 (NCH), 137.60 (NCHN), 176.00 (CH_2COO).

1-Ethyl-3-methylimidazolium butyrate 2d : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 0.79 (t, ^{3}J(H,H)=7.2 Hz, 3H, $CH_2CH_2CH_3$), 1.40 (m, 5H, NCH_2CH_3, $OOCCH_2CH_2CH_3$), 1.79 (t, ^{3}J(H,H)=7.2 Hz, 2H, $OOCCH_2$), 3.88 (s, 3H, NCH_3), 4.22 (q, ^{3}J(H,H)=7.2 Hz, 2H, CH_3CH_2), 7.82 (s, 1H, NCH), 7.92 (s, 1H, NCH), 10.25 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 14.59 ($CH_2CH_2CH_3$), 15.24 (NCH_2CH_3), 35.42 (NCH_3), 41.42 ($OOCCH_2$), 43.88 (NCH_2), 121.95 (NCH), 123.49 (NCH), 137.79 (NCHN), 175.44 (CH_2COO).

1-Ethyl-3-methylimidazolium *iso*-butyrate 2e : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 0.89 (d, ^{3}J(H,H)=6.8 Hz, 6H, $CH(CH_3)_2$), 1.41 (t, ^{3}J(H,H)=7.2 Hz, 3H, NCH_2CH_3), 1.95 (m, ^{3}J(H,H)=6.8 Hz, 1H, $(CH_3)_2CH$), 3.87 (s, 3H, NCH_3), 4.22 (q, ^{3}J(H,H)=7.2 Hz, 2H, CH_3CH_2), 7.76 (s, 1H, NCH), 7.86 (s, 1H, NCH), 10.03 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 15.21 (NCH_2CH_3), 21.08 ($CH(CH_3)_2$), 35.49 (NCH_3), 36.85 ($(CH_3)_2CH$), 43.94 (NCH_2), 121.90 (NCH), 123.46 (NCH), 137.53 (NCHN), 178.78 (CHCOO).

1-Ethyl-3-methylimidazolium *mono*-maleate 2f : ^{1}H-NMR (400 MHz; D_2O; 1,4-dioxane; δ/ppm) : 1.44 (t, ^{3}J(H,H)=7.2 Hz, 3H, NCH_2CH_3), 3.84 (s, 3H, NCH_3), 4.16 (q, ^{3}J(H,H)=7.2 Hz, 2H, CH_3CH_2), 6.21 (s, 2H, CCHCHC), 7.36 (s, 1H, NCH), 7.43 (s, 1H, NCH), 8.66 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; D_2O; 1,4-dioxane; δ/ppm): 15.05 (NCH_2CH_3), 36.17 (NCH_3), 45.37 (NCH_2), 122.47 (NCH), 124.06 (NCH), 134.49 (CHCH), 136.15 (NCHN), 172.17 (CHCOO).

Bis(1-ethyl-3-methylimidazolium) melate 2g : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.38 (t, ^{3}J(H,H)=7.2 Hz, 6H, NCH_2CH_3), 3.89 (s, 6H, NCH_3), 4.25 (q, ^{3}J(H,H)=7.2 Hz, 4H, CH_3CH_2), 5.41 (d, 2H, CHCH), 7.67 (d, ^{3}J(H,H)=1.6 Hz, 2H, NCH), 7.75 (d, ^{3}J(H,H)=1.6 Hz, 2H, NCH), 9.80 (s, 2H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 15.29 (NCH_2CH_3), 35.53 (NCH_3), 43.82 (NCH_2), 121.47 (NCH), 123.21 (NCH), 138.08 (NCHN), 171.06 (CHCOO).

1-Ethyl-3-methylimidazolium *mono*-succinate 2h : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.41 (t, ^{3}J(H,H)=7.2 Hz, 3H, NCH_2CH_3), 2.28 (t, 4H, CH_2CH_2), 3.85 (s, 3H, NCH_3), 4.19 (q, ^{3}J(H,H)=7.2 Hz, 2H, CH_3CH_2), 7.71 (s, 1H, NCH), 7.80 (s, 1H, NCH), 9.22 (s, 1H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 15.11 (NCH_2CH_3), 35.01 (NCH_3), 35.68 (CH_2CH_2), 44.12 (NCH_2), 121.99 (NCH), 123.58 (NCH), 136.40 (NCHN), 175.47 (CH_2COO).

Bis(1-ethyl-3-methylimidazolium) succinate 2i : ^{1}H-NMR (400 MHz; DMSO-*d6*; δ/ppm) : 1.39 (t, ^{3}J(H,H)=7.2 Hz, 6H, NCH_2CH_3), 1.97 (s, 4H, CH_2CH_2), 3.88 (s, 6H, NCH_3), 4.23 (q, ^{3}J(H,H)=7.2 Hz, 4H, CH_3CH_2), 7.79 (s, 2H, NCH), 7.88 (s, 2H, NCH), 10.24 (s, 2H, NCHN).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 15.26 (NCH_2CH_3), 35.44 (NCH_3), 37.25 (CH_2CH_2), 43.87 (NCH_2), 121.87 (NCH), 123.46 (NCH), 137.89 (NCHN), 176.96 (CH_2COO).

According to the literature [Z. Q. Zheng, J. Wang, T. H. Wu, X. P. Zhou, Advanced Synthesis & Catalysis 2007, 349, 1095], a few modifications were made to get pure product. Under argon protection, 7.0 g N,N-diethylammonium chloride (it was prepare by diethylamine with HCl gas, before using), 11 mL dimethylcarbonate were added into a 75 mL autoclave, then heated up to 383 K overnight. After removing the low boiling point compounds under reduced pressure and washing with acetone, the pure intermediate N,N-diethyl-N,N-dimethylimidazolium chloride were obtained, 8.5 g, yield: 90.1 %. Then the intermediate went through the anion exchange resin IRA-400 (OH), to get the corresponding hydroxide. The hydroxide was neutralized with stoichiometric acid. After removal of water under reduced pressure, the target molecule was obtained.

N,N-Diethyl-N,N-dimethylammonium Chloride:
^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.37 (m, 6H, CH_2CH_3), 3.05 (s, 6H, NCH_3), 3.40 (q, ^{3}J(H,H)=7.2 Hz, 4H, NCH_2).

N,N-Diethyl-N,N-dimethylammonium formate 3a : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.20 (t, ^{3}J(H,H)=7.2 Hz, 6H, CH_2CH_3), 2.99 (s, 6H, NCH_3), 3.34 (q, ^{3}J(H,H)=7.2 Hz, 4H, NCH_2), 8.58 (s, 1H, HCOO).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 7.75(CH_2CH_3), 48.74(NCH_3), 57.67(NCH_2), 164.97(HCOO)

N,N-Diethyl-N,N-dimethylammonium acetate 3b : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.19 (t, ^{3}J(H,H)=7.2 Hz, 6H, CH_2CH_3), 1.54(s, 3H, $OOCCH_3$), 3.00(s, 6H, NCH_3), 3.37(q, ^{3}J(H,H)=7.2 Hz, 4H, NCH_2).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 7.74 (CH_2CH_3), 25.91 ($OOCCH_3$), 48.65 (NCH_3), 57.52 (NCH_2), 172.52 (CH_3COO)

N,N-Diethyl-N,N-dimethylammonium propionate 3c : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 0.85 (t, ^{3}J(H,H)=7.6 Hz, 3H, CH_2CH_3), 1.20 (t, ^{3}J(H,H)=7.2 Hz, 6H, NCH_2CH_3), 1.77 (q, ^{3}J(H,H)=7.6 Hz, 2H, CH_3CH_2), 3.01(s, 6H, NCH_3), 3.36 (q, ^{3}J(H,H)=7.2 Hz, 4H, NCH_2).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 7.74 (NCH_2CH_3), 11.55 (CH_2CH_3), 31.58 (CH_3CH_2), 48.66 (NCH_3), 57.55 (NCH_2), 175.50 (CH_2COO).

N,N-Diethyl-N,N-dimethylammonium butyrate 3d : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 0.78 (t, ^{3}J(H,H)=7.2 Hz, 3H, $CH_2CH_2CH_3$), 1.20 (t, ^{3}J(H,H)=7.2 Hz, 6H, NCH_2CH_3), 1.36 (m, 2H, $OOCCH_2CH_2$), 1.73 (t, ^{3}J(H,H)=7.2 Hz, 2H, $OOCCH_2$), 3.00 (s, 6H, NCH_3), 3.36 (q, ^{3}J(H,H)=7.2 Hz, 4H, NCH_2).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 7.74 (NCH_2CH_3), 14.66 (CH_2CH_3), 20.00 ($OOCCH_2CH_2$), 41.58 ($OOCCH_2$), 48.69 (NCH_3), 57.59 (NCH_2), 174.58 (CH_2COO).

N,N-Diethyl-N,N-dimethylammonium *iso*-butyrate 3e : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 0.87 (d, ^{3}J(H,H)=6.8 Hz, 6H, $CH(CH_3)_2$), 1.20 (t, ^{3}J(H,H)=7.2 Hz, 6H, NCH_2CH_3), 1.92 (m, ^{3}J(H,H)=6.8 Hz, 1H, $(CH_3)_2CH$), 2.99 (s, 6H, NCH_3), 3.35 (q, ^{3}J(H,H)=7.2 Hz, 4H, NCH_2).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 7.73 (CH_2CH_3), 21.05 ($CH(CH_3)_2$), 36.72 (($CH_3)_2CH$), 48.70 (NCH_3), 57.61 (NCH_2), 178.20 (CHCOO).

N,N-Diethyl-N,N-dimethylammonium *mono*-maleate 3f : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.22 (t, ^{3}J(H,H)=7.2 Hz, 6H, CH_2CH_3), 2.96 (s, 6H, NCH_3), 3.30 (q, ^{3}J(H,H)=7.2 Hz, 4H, NCH_2), 6.04 (s, 2H, CHCH).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 7.72 (CH_2CH_3), 48.86 (NCH_3), 57.93 (NCH_2), 136.04 (CHCH), 167.22 (CHCOO)

Bis(N,N-diethyl-N,N-dimethylammonium) maleate 3g : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.19 (t, ^{3}J(H,H)=7.2 Hz, 12H, CH_2CH_3), 3.01 (s, 12H, NCH_3), 3.38 (q, ^{3}J(H,H)=7.2 Hz, 8H, NCH_2), 5.27 (s, 2H, CHCH).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 7.80 (CH_2CH_3), 48.71 (NCH_3), 57.45 (NCH_2), 130.18 (CHCH), 170.47 (CHCOO)

N,N-Diethyl-N,N-dimethylammonium *mono*-succinate 3h : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.22 (t, ^{3}J(H,H)=7.2 Hz, 6H, CH_2CH_3), 2.22 (s, 4H, CH_2CH_2), 2.96 (s, 6H, NCH_3), 3.30 (q, ^{3}J(H,H)=7.2 Hz, 4H, NCH_2).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 7.72 (CH_2CH_3), 33.03 (CH_2CH_2), 48.83 (NCH_3), 57.87 (NCH_2), 175.36 (CH_2COO)

Bis(N,N-diethyl-N,N-dimethylammonium) succinate 3i : ^{1}H-NMR (400 MHz; DMSO-d_6; δ/ppm) : 1.19 (t, ^{3}J(H,H)=7.2 Hz, 12H, CH_2CH_3), 1.86 (s, 8H, CH_2CH_2), 3.01 (12H, s, NCH_3), 3.37 (q, ^{3}J(H,H)=7.2 Hz, 4H, NCH_2).
^{13}C-NMR (100 MHz; DMSO-d_6; δ/ppm): 7.76 (CH_2CH_3), 37.62 (CH_2CH_2), 48.63 (NCH_3), 57.48 (NCH_2), 176.37 (CH_2COO).