Electronic Supplementary Material (ESI) for RSC Advances.
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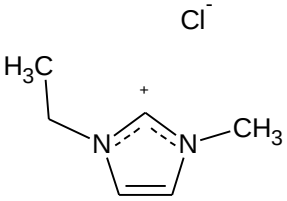
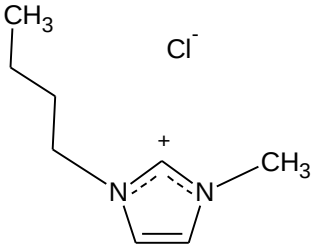
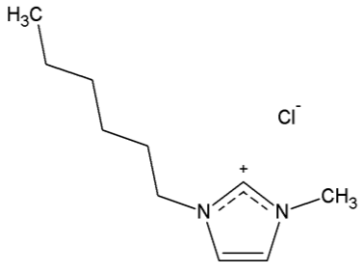
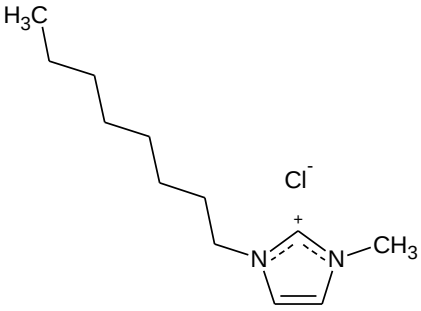
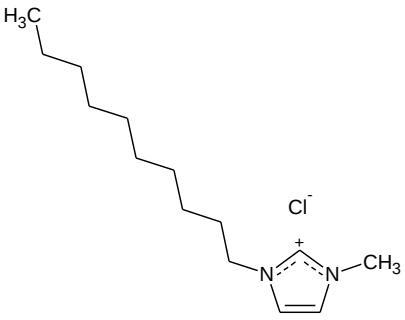
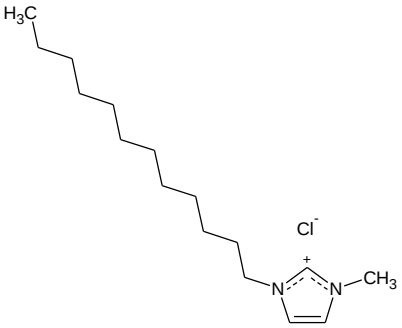
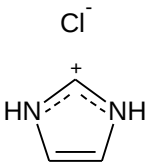
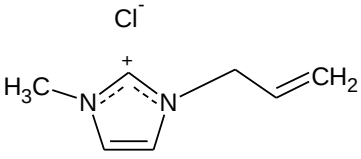
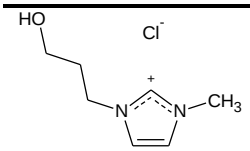
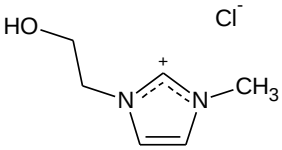
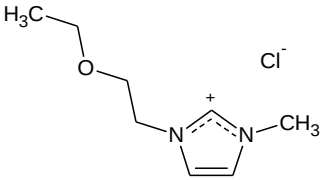
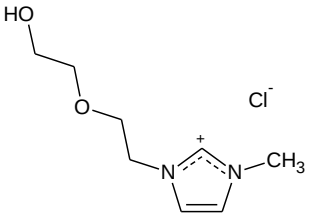
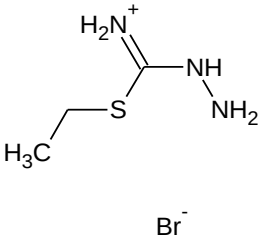
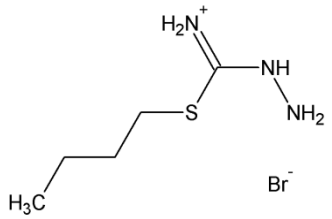
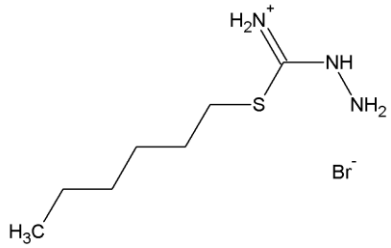
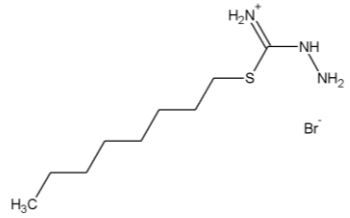
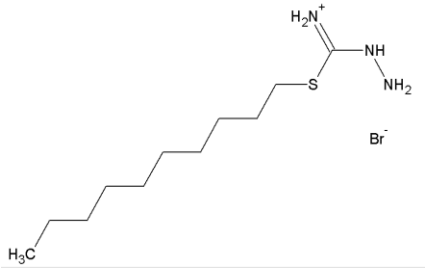
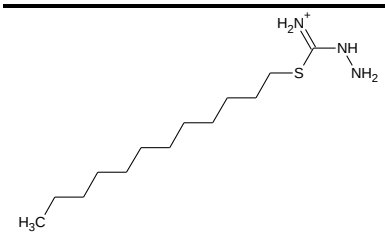
Supplementary Table 1S: Provenance, purity and structures of the tested ILs

Molecular structure of IL	Name of IL	Provenance and CAS Number	Purity
 [emim][Cl]	1-ethyl-3-methylimidazolium chloride	IoLiTec 65039-09-0	ω ≥ 98%
 [bmim][Cl]	1-butyl-3-methylimidazolium chloride	IoLiTec 79917-90-1	ω ≥ 99%
 [hmim][Cl]	1-hexyl-3-methylimidazolium chloride	IoLiTec 171058-17-6	ω ≥ 99%
	1-octyl-3-methylimidazolium chloride	IoLiTec 64697-40-1	ω ≥ 99%

[omim][Cl]		1-decyl-3-methylimidazolium chloride	IoLiTec 171058-18-7	ω ≥ 98%
[dmim][Cl]		1-dodecyl-3-methylimidazolium chloride	IoLiTec 114569-84-5	ω ≥ 98%
[ddmim][Cl]		Imidazolium chloride	synthesized[a]	ω ≥ 97%
[im][Cl]		1-allyl-3-methylimidazolium chloride	IoLiTec 65039-10-3	ω ≥ 98%
[Allyl-mim][Cl]				

 [OHC_3mim][Cl]	1-(3-hydroxypropyl)-3-methylimidazolium chloride	synthesized[a]	ω ≥ 99%
 [OHC_2mim][Cl]	1-(2-hydroxyethyl)-3-methylimidazolium chloride	synthesized[a]	ω ≥ 98%
 [C_2OC_2mim][Cl]	1-ethyl-(2-etoxy)-3-methylimidazolium chloride	synthesized[a]	ω ≥ 98%
 [OHC_2OC_2mim][Cl]	1-(4-hydroxy-2-oxy)butyl-3-methylimidazolium chloride	synthesized[a]	ω ≥ 97%
 [eTSC][Br]	*S*-ethylthiosemicarbazidium bromide	SLE[b], Rotary evaporation followed by drying	ω ≥ 98%

 [bTSC][Br]	*S*-butylthiosemicarbazidium bromide	SLE[b], Rotary evaporation followed by drying	ω ≥ 98%
 [hTSC][Br]	*S*-hexylthiosemicarbazidium bromide	SLE[b], Rotary evaporation followed by drying	ω ≥ 98%
 [oTSC][Br]	*S*-octylthiosemicarbazidium bromide	SLE[b], Rotary evaporation followed by drying	ω ≥ 97%
 [dTSC][Br]	*S*-deciltiosemikarbazidijum bromid	SLE[b], Rotary evaporation followed by drying	ω ≥ 96%

 [ddTSC][Br]	*S*-dodecylthiosemicarbazidium bromide	SLE[b], Rotary evaporation followed by drying	$\omega \geq 97\%$

[a] already synthesized in Tot et al.
[b] SLE = solid-liquid extraction

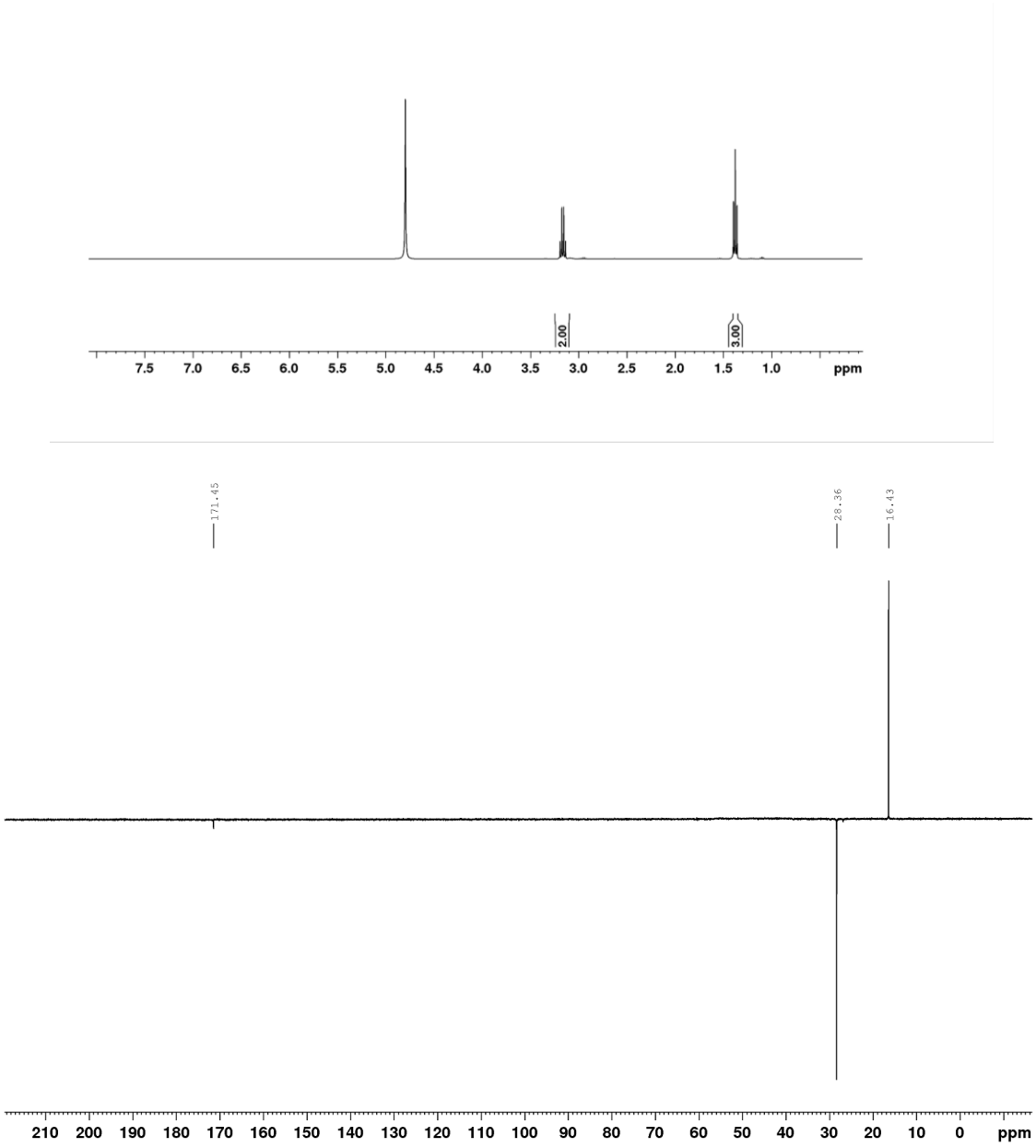


Fig. 1. ^{1}H and ^{13}C NMR spectra of [eTSC][Br]

^{1}H NMR (D_2O): 1.38, t, 3H; $J_{CH2,CH3}$=7.4 Hz, CH_2CH_3; 3.16, q, 2H, CH_2CH_3.

^{13}C NMR (D_2O): 16.43 (CH_2CH_3); 28.36 (CH_2CH_3); 171.45 [$SC(NH_2)^{+}NHNH_2$]

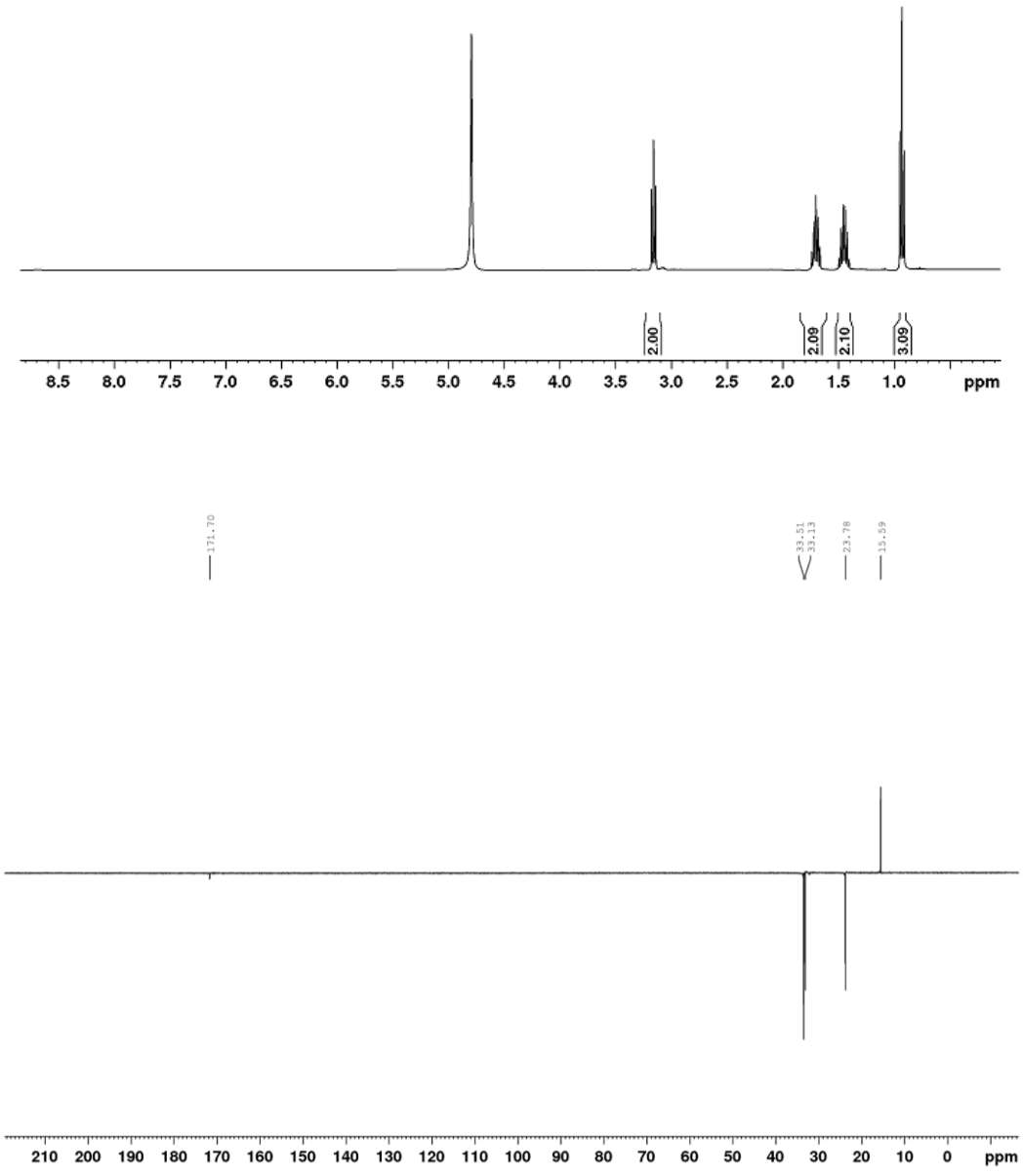


Fig. 2. ^{1}H and ^{13}C NMR spectra of [bTSC][Br]

^{1}H NMR (D_2O): 0.93, t, 3H, $J_{CH2,CH3}$=7.4 Hz, CH_3; 1.45, m, 2H, CH_2-3; 1.70, m, 2H, CH_2-2; 3.16, t, 2H, $J_{CH2,CH2}$=7.3 Hz, CH_2-1.

^{13}C NMR (D_2O): 15.59 (*C*H_3); 23.78 (*C*H_2-3); 33.13 (*C*H_2-2); 33.51 (*C*H_2-1); 171.70 [S*C*$(NH_2)^{+}NHNH_2$].

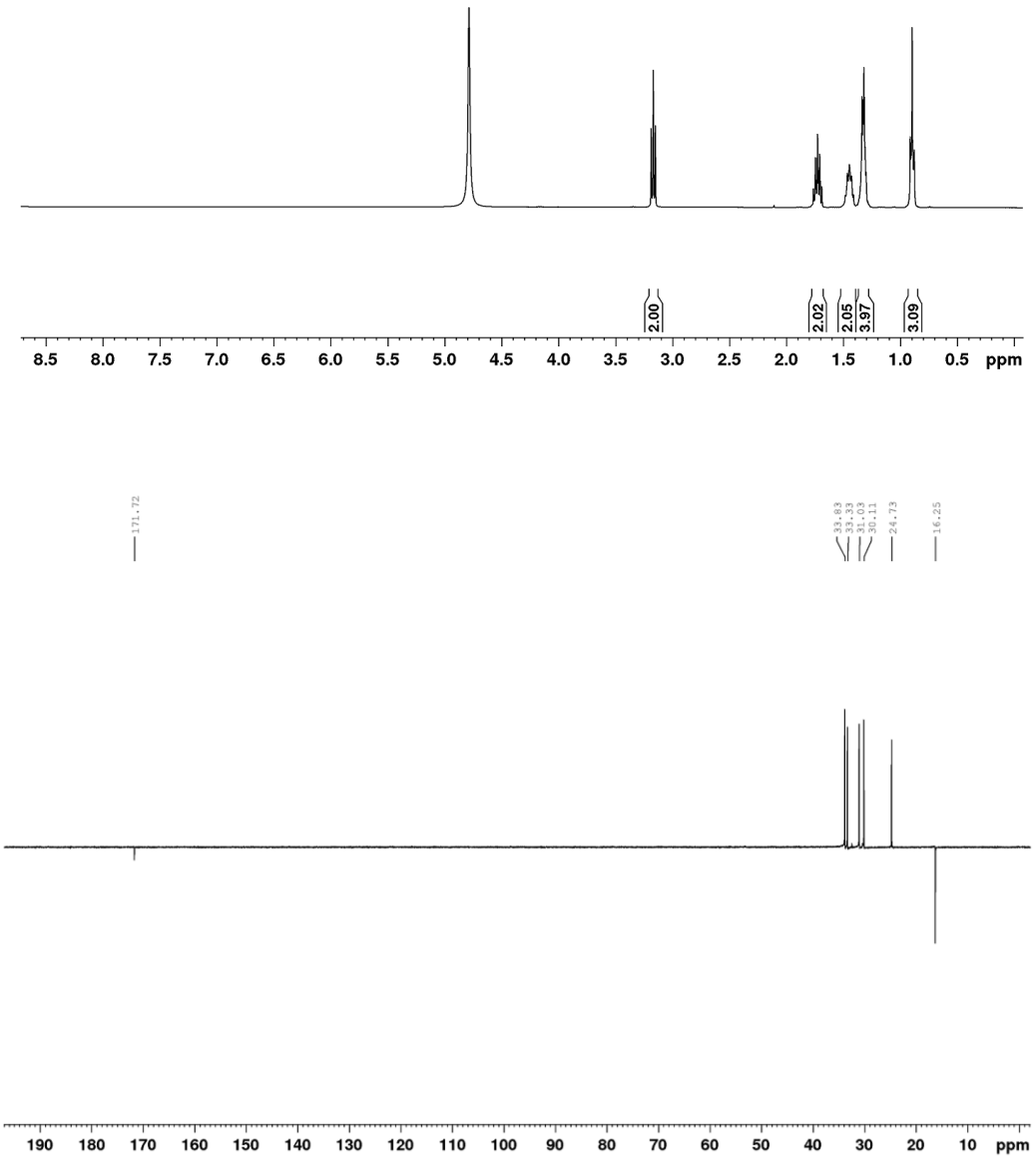


Fig. 3. ^{1}H and ^{13}C NMR spectra of [hTSC][Br]

^{1}H NMR (D_2O): 0.89, t, 3H, $J_{CH2,CH3}$=7.2 Hz, C*H*$_3$; 1.27-1.37, m, 4H, C*H*$_2$-4 i C*H*$_2$-5; 1.45, m, 2H, C*H*$_2$-3; 1.72, m, 2H, C*H*$_2$-2; 3.17, t, 2H, $J_{CH2,CH2}$=7.3 Hz, C*H*$_2$-1..

^{13}C NMR (D_2O): 16.25 (*C*H$_3$); 24.73 (*C*H$_2$-5); 30.11 (*C*H$_2$-3); 31.03 (*C*H$_2$-2); 33.33(*C*H$_2$-4); 33.83 (*C*H$_2$-1); 171.72 [S*C*$(NH_2)^+NHNH_2$].

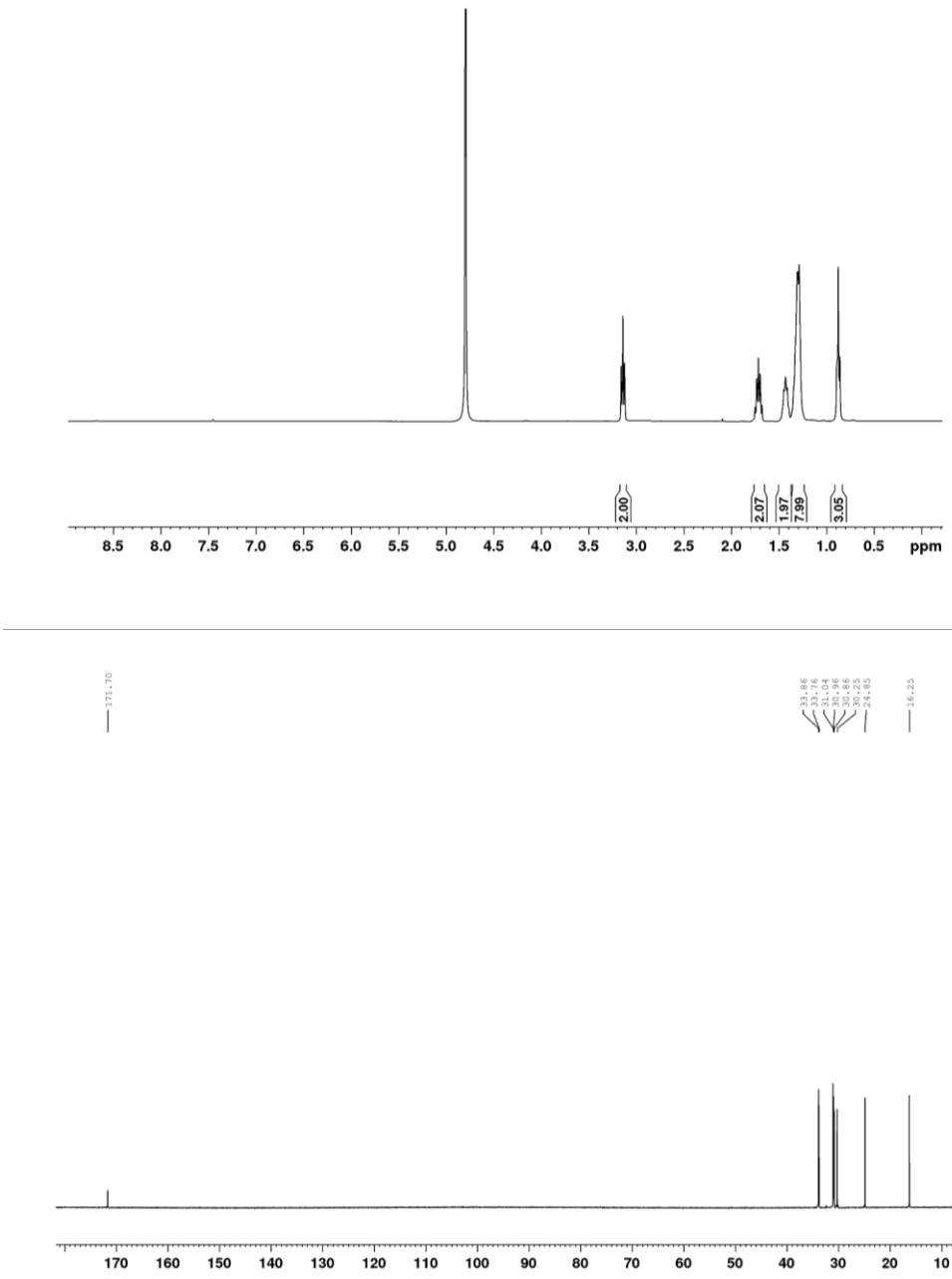


Fig. 4. ^{1}H and ^{13}C NMR spectra of [oTSC][Br]

^{1}H NMR (D_2O): 0.88, t, 3H; $J_{CH2,CH3}$=7.2 Hz, C*H*$_3$, 1.22-1.37, *m*, 8H; C*H*$_2$-4, C*H*$_2$-5, C*H*$_2$-6 i C*H*$_2$-7, 1.43, m, 2H, C*H*$_2$-3; 1.71, m, 2H, C*H*$_2$-2; 3.14, t, 2H, $J_{CH2,CH2}$=7.2 Hz, C*H*$_2$-1..

^{13}C NMR (D_2O): 16.25 (*CH*$_3$); 24.85 (*C*H$_2$-7); 30.25 (*C*H$_2$-3); 30.86 and 31.04 (*C*H$_2$-4 and *C*H$_2$-5); 30.96 (*C*H$_2$-2); 33.76(*C*H$_2$-1); 33.86 (*C*H$_2$-6); 171.70 [S*C*$(NH_2)^+$NHNH$_2$].

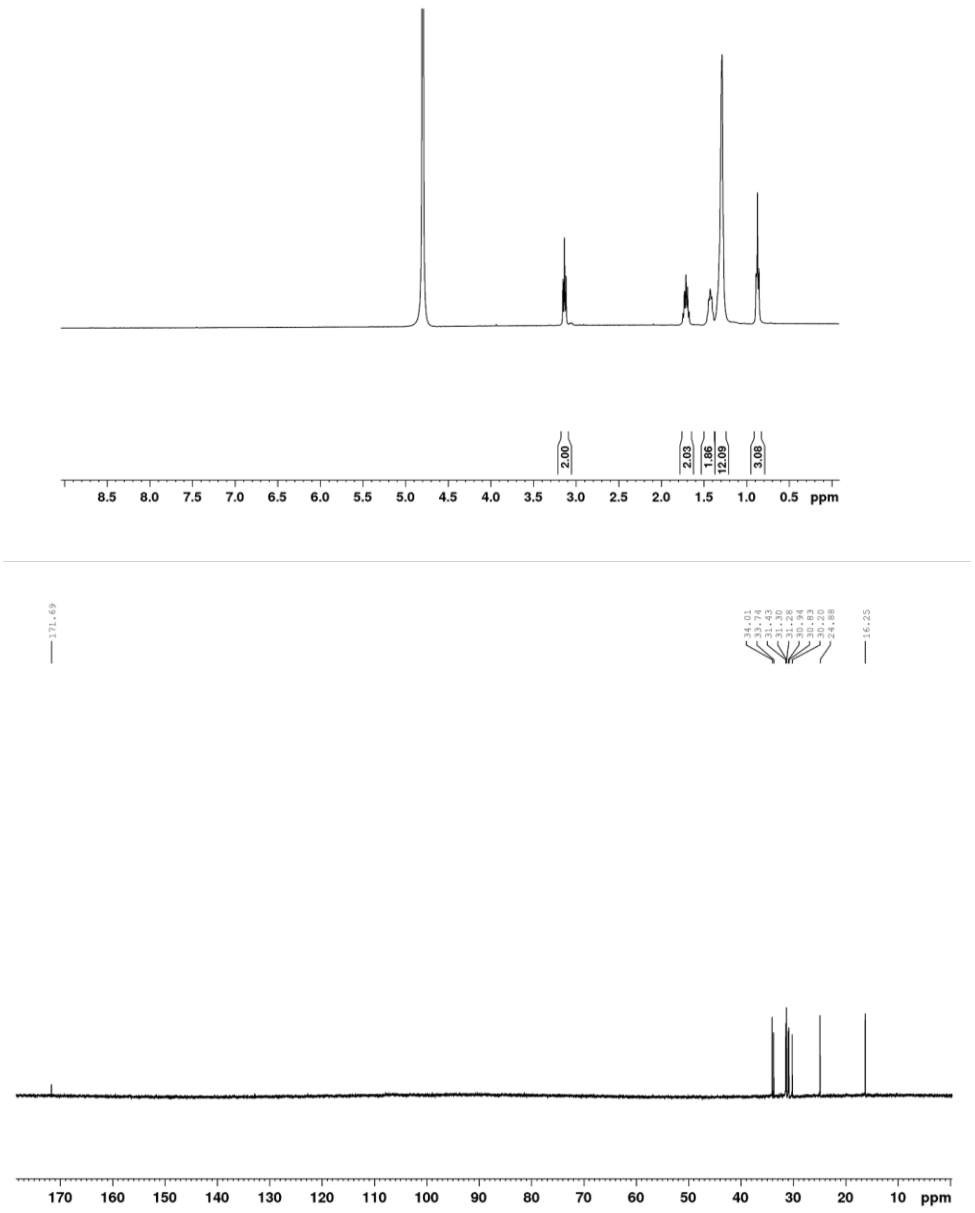


Fig. 5. 1H and 13C NMR spectra of [dTSC][Br]

^{1}H NMR (D_2O): 0.87, t, 3H, $J_{CH2,CH3}$=7.0 Hz, CH_3, 1.21-1.37, m, 8H, CH_2-4, CH_2-5, CH_2-6, CH_2-7, CH_2-8 and CH_2-9, 1.42, m, 2H, CH_2-3, 1.71, m, 2H, CH_2-2, 3.13, t, 2H, $J_{CH2,CH2}$=7.3 Hz, CH_2-1.

^{13}C NMR (D_2O): 16.25 (CH_3), 24.88 (CH$_2$-8), 30.20 (CH$_2$-3), 30.83, 31.28, 31.30, 31.43 (CH$_2$-4, CH$_2$-5, CH$_2$-6, CH$_2$-7,), 30.94 (CH$_2$-2), 33.74 (CH$_2$-1), 34.01(CH$_2$-5), 171.69 [SC(NH_2)$^+$NHNH_2].

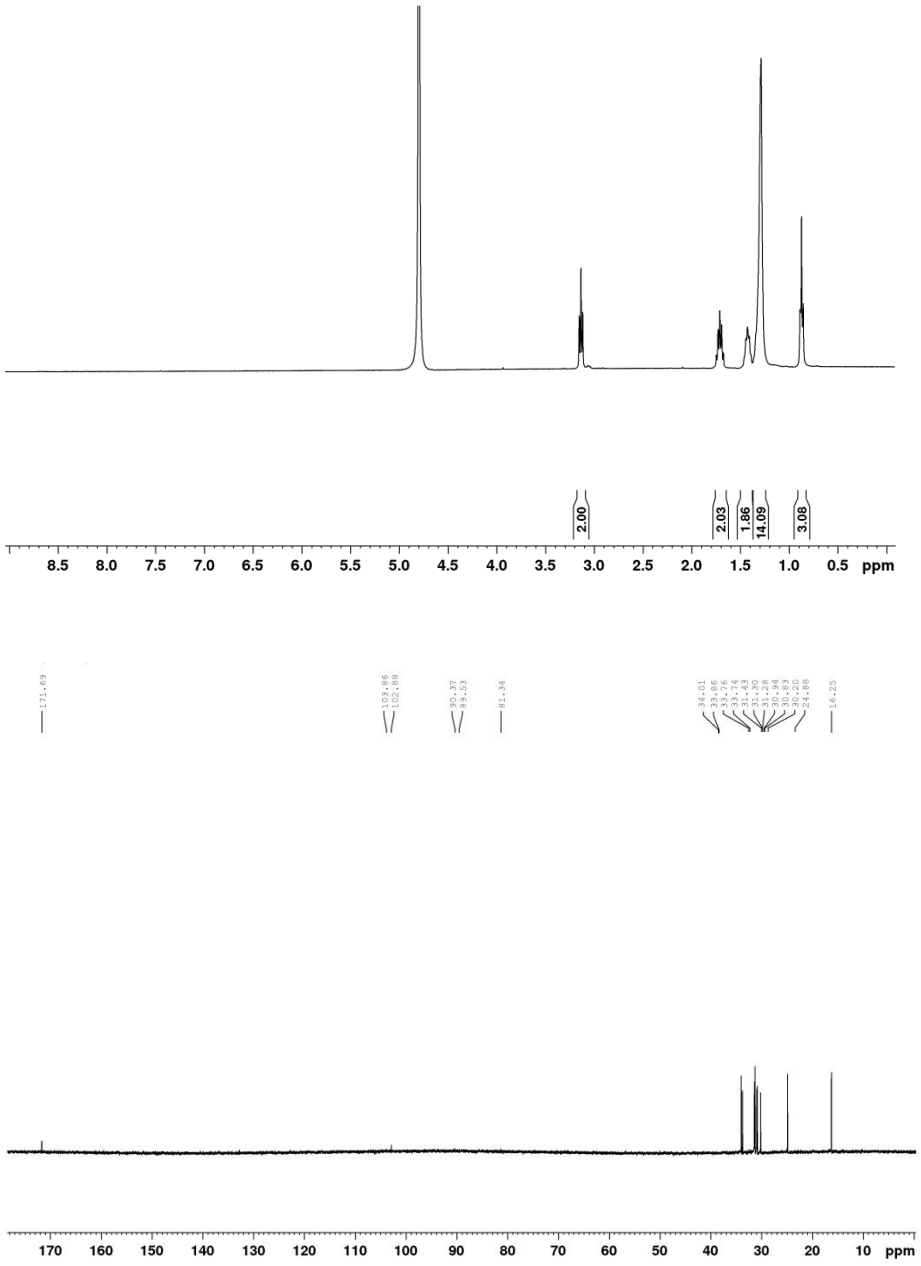


Fig. 6. 1H and 13C NMR spectra of [ddTSC][Br]

^{1}H NMR (D_2O): 0.89, t, 3H, $J_{CH2,CH3}$=7.0 Hz, CH_3, 1.23-1.44, m, 10H, CH_2-4, CH_2-5, CH_2-6, CH_2-7, CH_2-8, CH_2-9, CH_2-10 and CH_2-11,1.43, m, 2H, CH_2-3, 1.79, m, 2H, CH_2-2, 3.13, t, 2H, $J_{CH2,CH2}$=7.3 Hz, CH_2-1..

^{13}C NMR (D_2O): 16.25 (CH_3), 24.88 (CH_2-10), 30.20 (CH_2-3), 30.83, 31.28, 31.30, 31.43, 31.45 and 31.47 (CH_2-4, CH_2-5, CH_2-6, CH_2-7, CH_2-8, CH_2-9), 30.94 (CH_2-2), 33.74 (CH_2-1), 34.01(CH_2-5), 171.69 [SC(NH_2)$^{+}$$NHNH_2$].

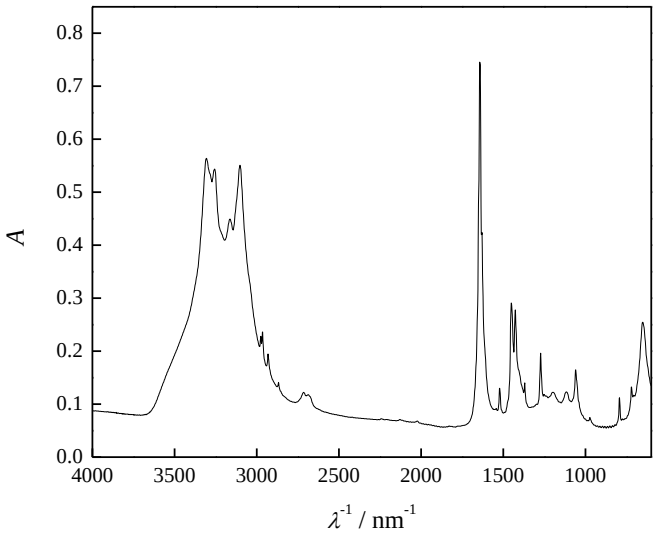


Fig. 7. IR spectra of [eTSC][Br]

3396 (N-H stretching); 2986 and 2925(C-H stretching); 1563 (CH stretching), 1486 (C=N stretching), 756 (C-S-C stretching)

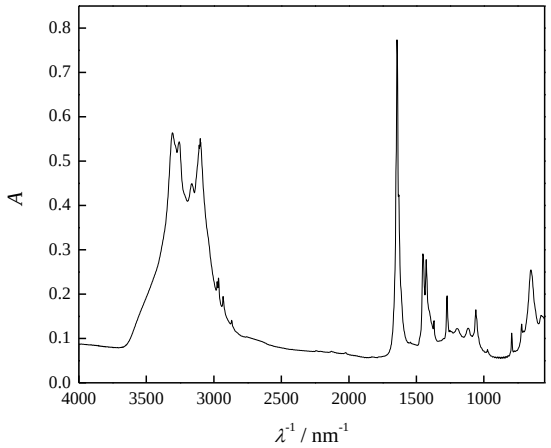


Fig. 8. IR spectra of [bTSC][Br]

3382 (N-H stretching); 2977 and 2901(C-H stretching); 1567 (CH stretching), 1483 (C=N stretching), 754 (C-S-C stretching)

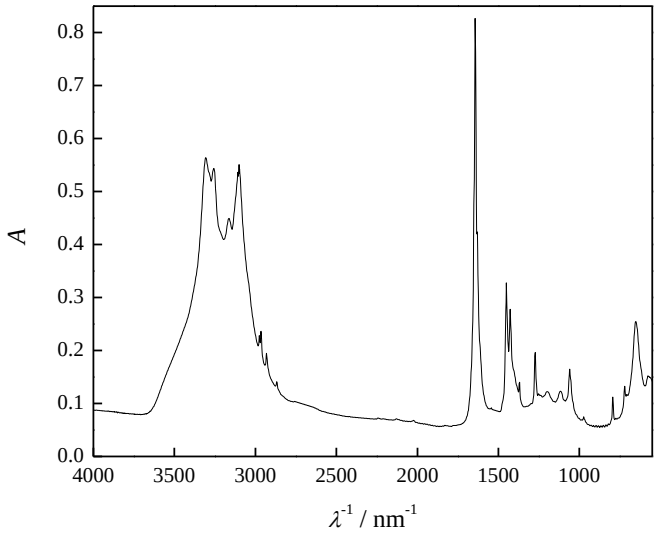


Fig. 9. IR spectra of [hTSC][Br]

3374 (N-H stretching); 2972 and 2911(C-H stretching); 1576 (CH stretching), 1491 (C=N stretching), 752 (C-S-C stretching)

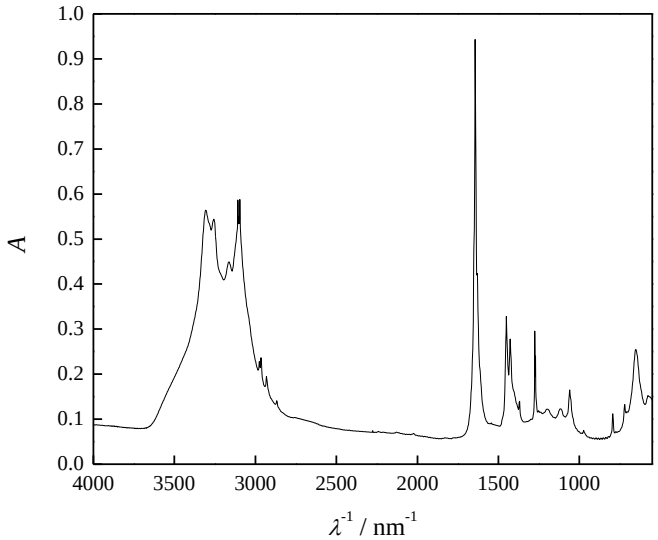


Fig. 10. IR spectra of [oTSC][Br]

3392 (N-H stretching); 2987 and 2906(C-H stretching); 1575 (CH stretching), 1492 (C=N stretching), 753 (C-S-C stretching)

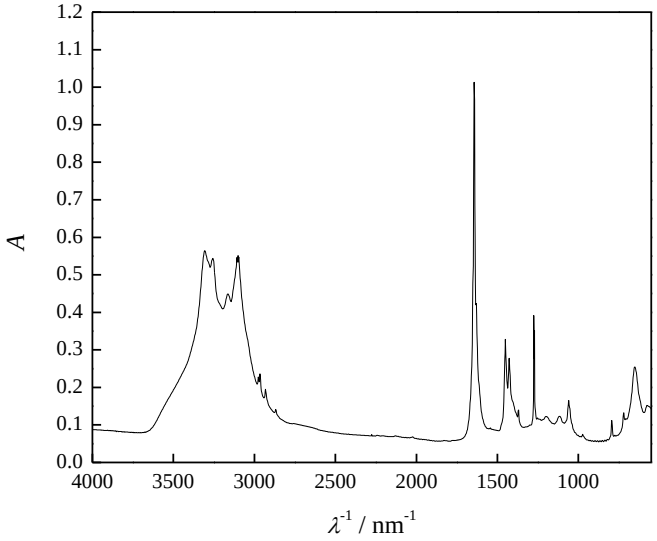


Fig. 11. IR spectra of [dTSC][Br]

3397 (N-H stretching); 2991 and 2932(C-H stretching); 1588 (CH stretching), 1494 (C=N stretching), 751 (C-S-C stretching)

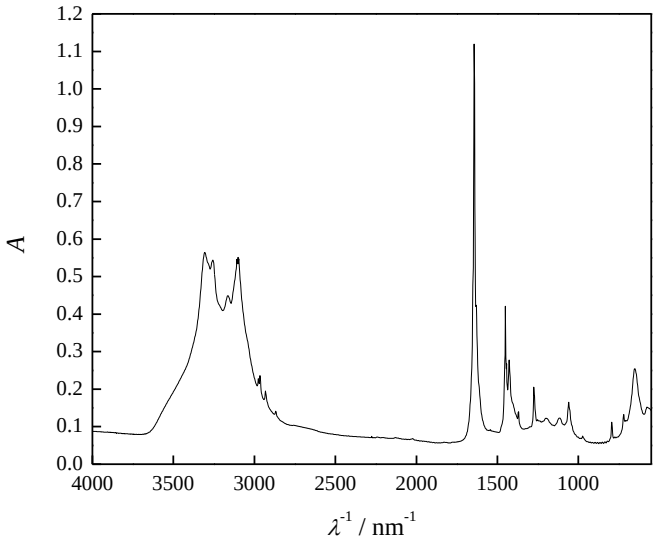


Fig.12. IR spectra of [ddTSC][Br]

3395 (N-H stretching); 2988 and 2932(C-H stretching); 1587 (CH stretching), 1495 (C=N stretching), 754 (C-S-C stretching)