Supplementary Information

Dissolution of wool in ionic liquids

Table S1. Solubility of wool in ionic liquids

ILs	Condition/°C	Time/H	Solubility (mg/g ± 12.5)	Appearance
[BMIM]Cl	130	10	250	soluble
[AMIM]Cl	130	10	200	soluble
[choline][thioglycolate]	130	10	225	soluble
[AMIM][dca]	130	10	475	soluble

Regenerated wool keratin material from ionic liquids

Table S2. Mass of regenerated wool keratin material from dissolution in ionic liquids

ILs	*Mass of wool keratin dissolved (mg)	Mass of regenerated wool keratin (mg)	Percentage wool keratin recovered (% ± 2)
[BMIM]Cl	500.0	200.0	40
[AMIM]Cl	400.0	124.0	31
[choline][thioglycolate]	450.0	195.0	43
[AMIM][dca]	950.0	208.0	22

* Mass of wool dissolved in 2 g of ILs

Table S3. Solubility of wool in ionic liquids with and without reducing agent

ILs	*Reducing agent		Condition/°C	Time/H	Solubility (mg/g ± 12.5)	Appearance
	with	without				
[BMIM]Cl		✓	130	10	250	soluble
[BMIM]Cl	✓		130	10	330	soluble
[AMIM]Cl		✓	130	10	200	soluble
[AMIM]Cl	✓		130	10	250	soluble
[choline][thioglycolate]		✓	130	10	230	soluble
[choline][thioglycolate]	✓		130	10	330	soluble
[AMIM][dca]		✓	130	10	480	soluble
[AMIM][dca]	✓		130	10	550	soluble

*Reducing agent used: 2-mercaptoethanol

Table S4. Solubility of wool in deep eutectic solvent mixtures*

Component A	Component B	Condition/°C	Time/H	Solubility (mg/g ± 12.5)	Appearance
choline chloride	Urea	130	10	120	soluble
choline chloride	oxalic acid	130	10	30	soluble
calcium chloride	Urea	130	10	-	insoluble

* Ratio by mol (1 Component A : 2 Component B)

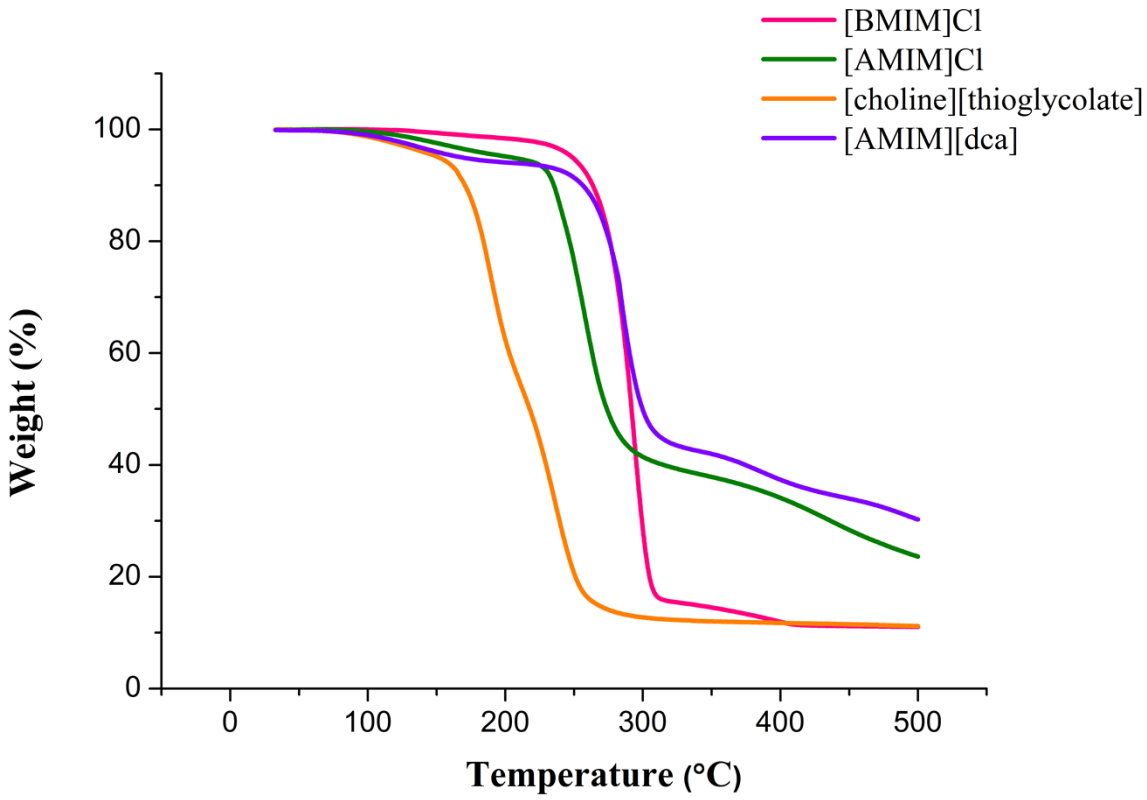

Figure S1. Single heating scan TGA traces of pure ionic liquids

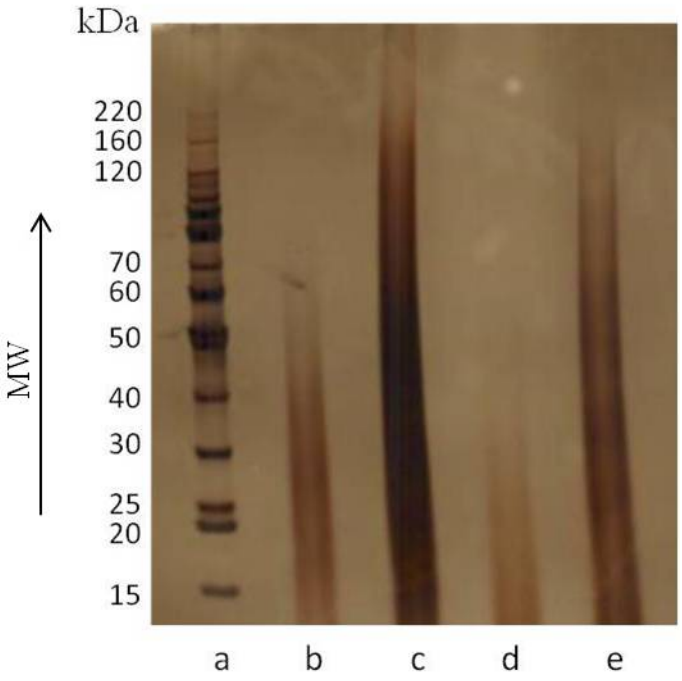

Figure S2. SDS-PAGE pattern of (a) protein standard (b) water soluble fraction from [BMIM]Cl, (c) water soluble fraction from [AMIM]Cl, (d) water soluble fraction from [choline][thioglycolate] and (e) water soluble fraction from [AMIM][dca].