Electronic Supplementary Informations

Physicochemical characterizations of novel dicyanamide -based ionic liquids applied as electrolytes for supercapacitors.

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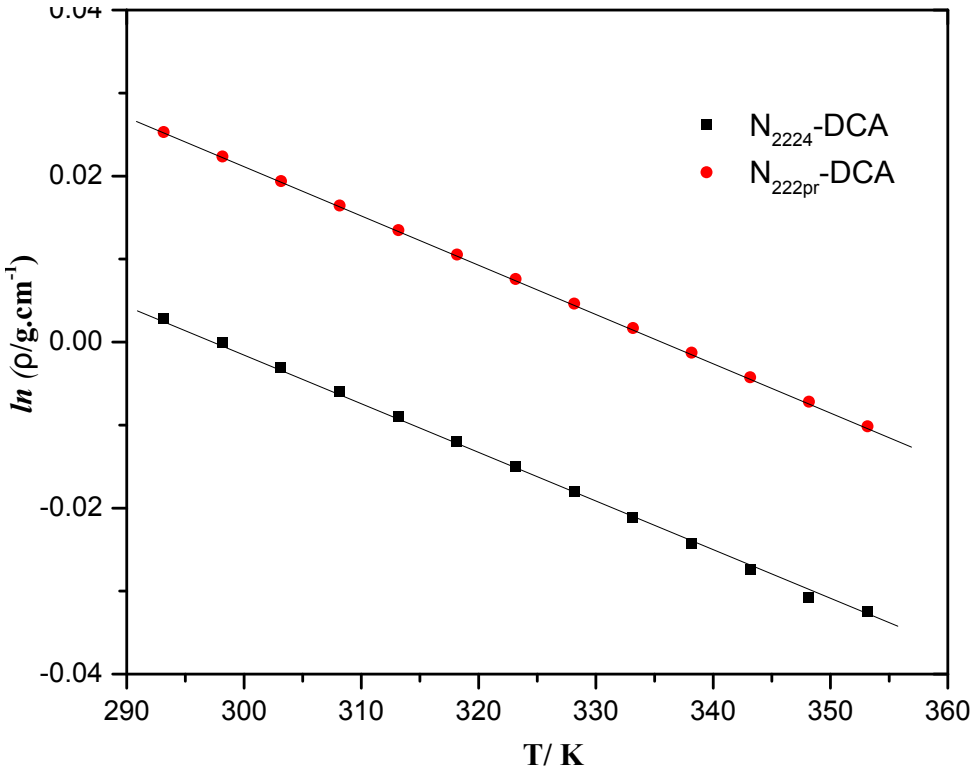


Figure S1. Variation of lnρ of ILs with the temperature range 298 to 353K.

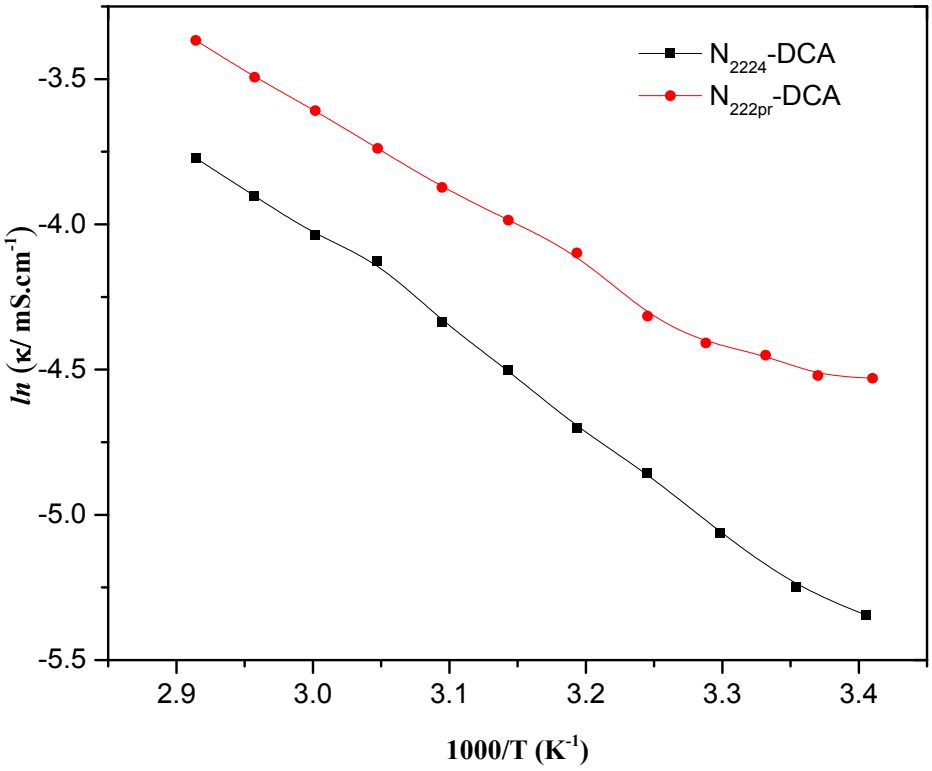


Figure S2. Plot of *lnκ* against 1000/T, from the temperature range 298 to 353K.

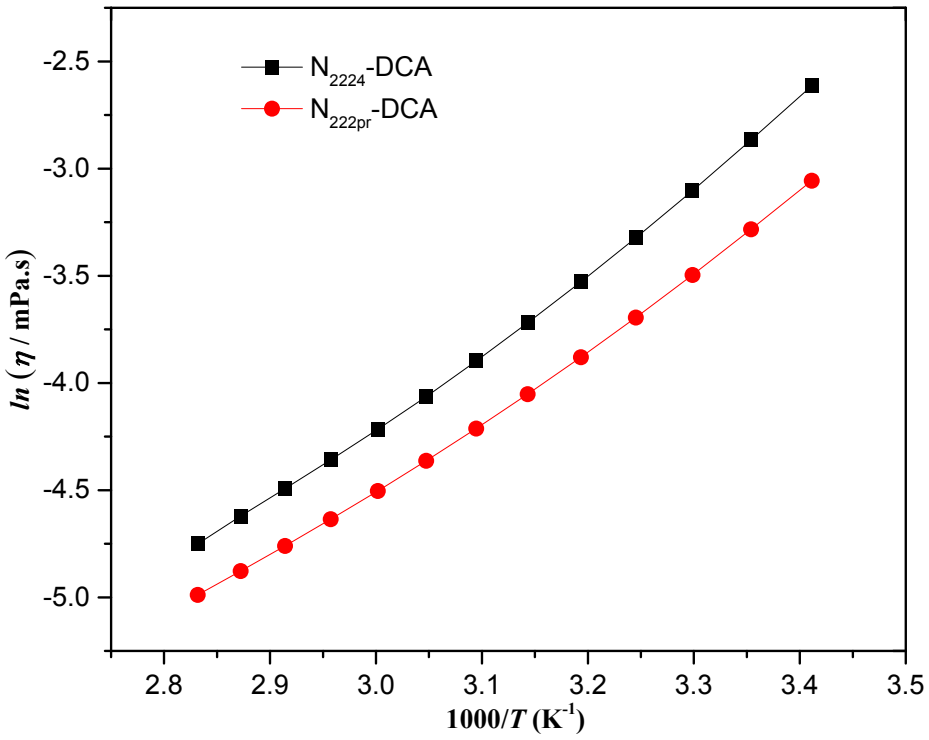


Figure S3: Plot of *lnη* against 1000/T, from the temperature range 298 to 353K.

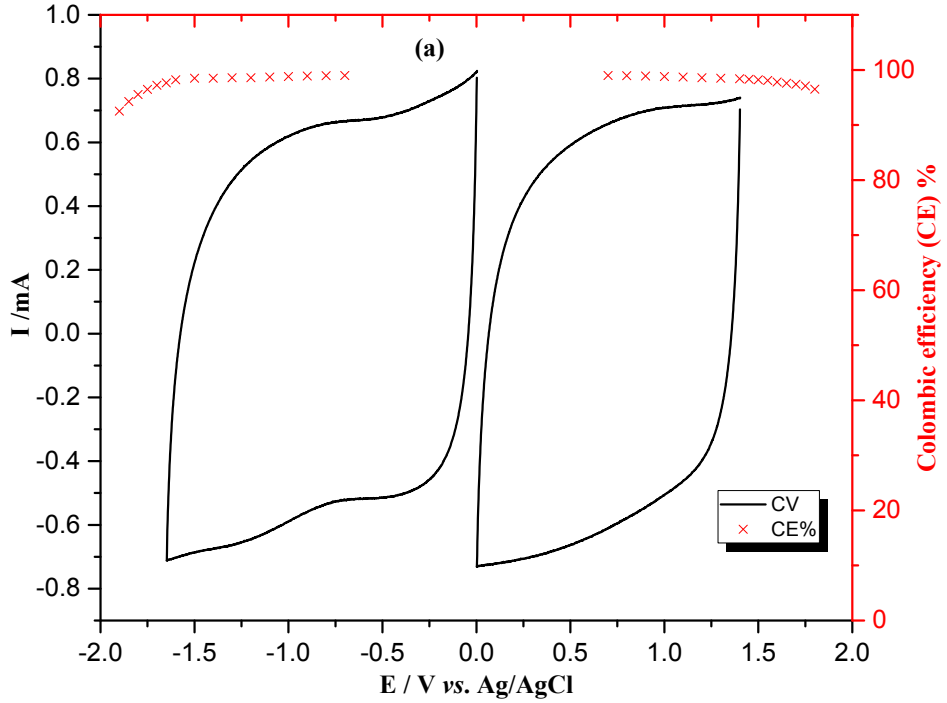


Figure S4-a: Maximum operating voltage determination for N_{2224}-DCA IL, using cyclic voltammetry. Coulombic efficiency (CE%) of cells used in the determination of anodic/cathodic limits. Cells cycled from OCP to 0.7 V, then in 0.1 or 0.05V increments to 2.0 V. Limit defined by the potential at which 98.5% efficiency was observed. Fresh cells used to determine the cathodic limit, cycling from OCP to – 0.70 V initially and in 0.1 or 0.05 V increments to – 2 V.

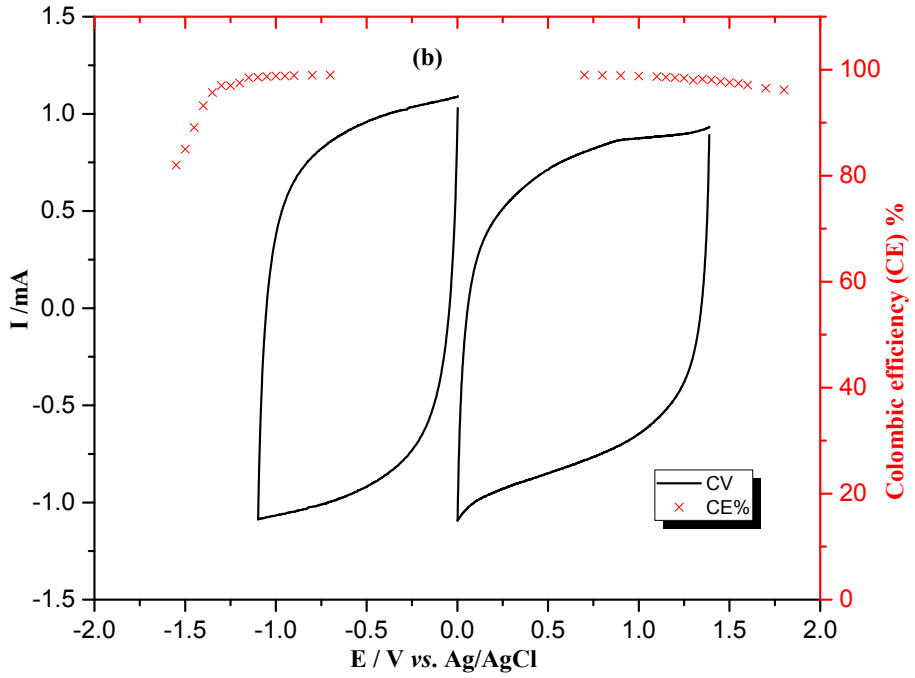
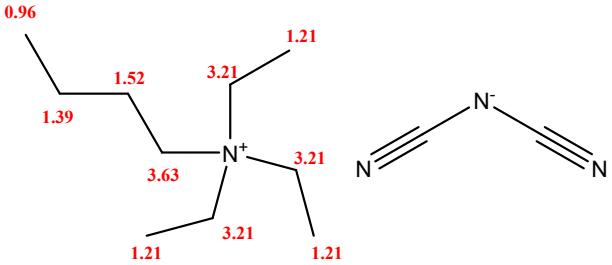


Figure S4-b: Maximum operating voltage determination for N_{222pr}-DCA IL, using cyclic voltammetry. Coulombic efficiency (CE%) of cells used in the determination of anodic/cathodic limits. Cells cycled from OCP to 0.7 V, then in 0.1 or 0.05V increments to 2.0 V. Limit defined by the potential at which 98.5% efficiency was observed. Fresh cells used to determine the cathodic limit, cycling from OCP to – 0.70 V initially and in 0.1 or 0.05 V increments to – 2.

^{1}H NMR Spectra of ILs

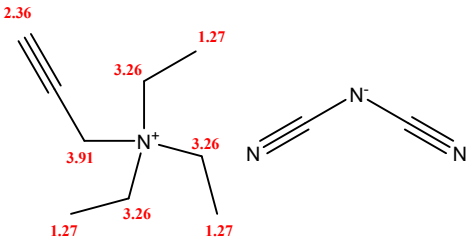
Triethyl-butylammonium dicyanamide N_{2224}-DCA

^{1}H NMR (500 MHz, Chloroform-*d*) δ= 3.63 (t, *J* = 5.1 Hz, 2H), 3.21 (qd, *J* = 6.0, 1.1 Hz, 6H), 1.57 – 1.47 (m, 2H), 1.46 – 1.33 (m, 2H), 1.27 (t, *J* = 6.0 Hz, 9H), 0.96 (t, *J* = 7.6 Hz, 3H).

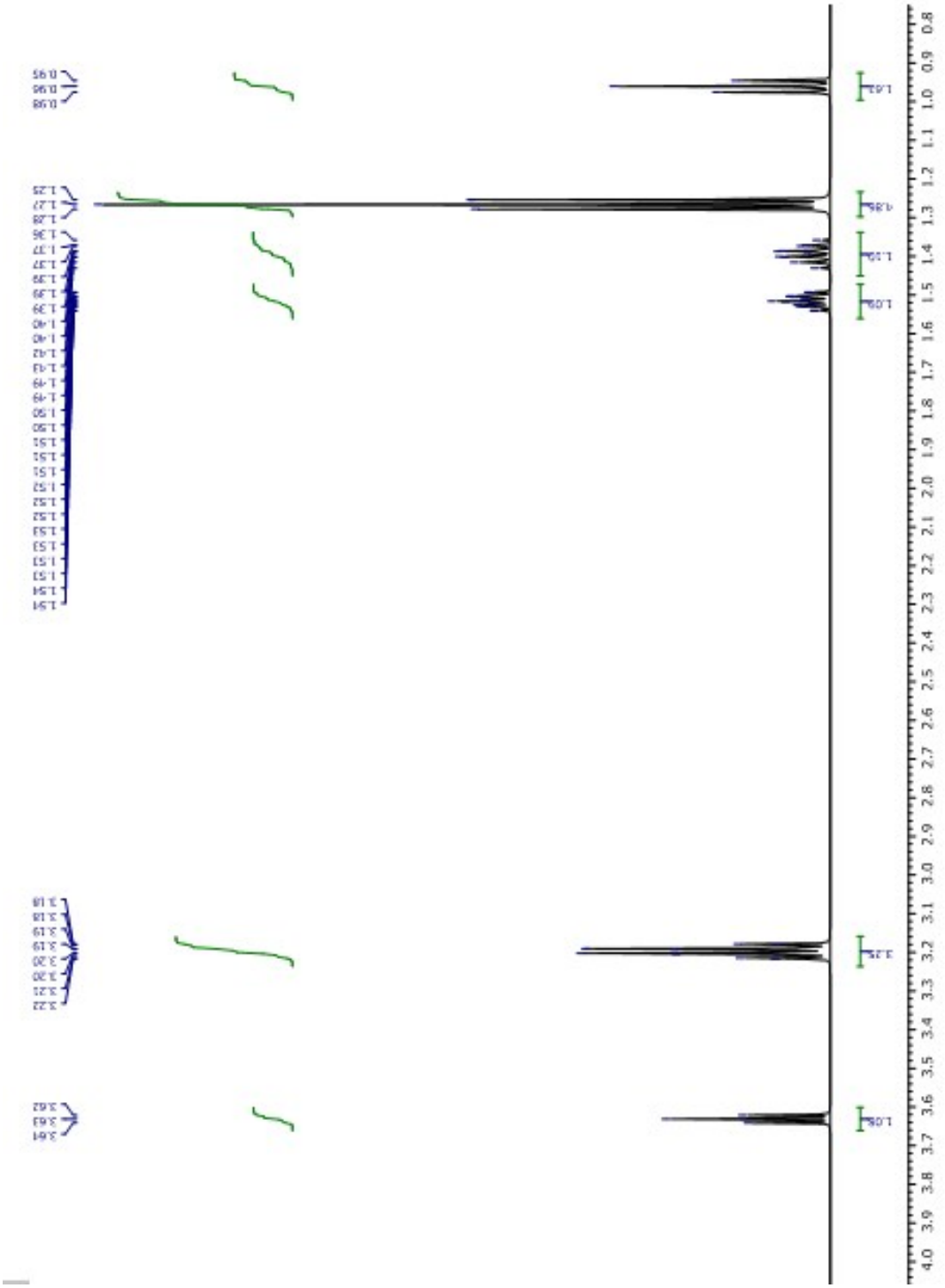


Triethyl-propargylammonium dicyanamide N_{222pr}-DCA

^{1}H NMR (500 MHz, Chloroform-*d*) δ =3.91 (d, *J* = 2.9 Hz, 2H), 3.26 (q, *J* = 6.0 Hz, 6H), 2.38 (t, *J* = 2.9 Hz, 1H), 1.27 (t, *J* = 6.0 Hz, 9H).



Triethyl-butylammonium dicyanamide N_{2224}-DCA



Triethyl-propargylammonium dicyanamide N_{222pr}-DCA