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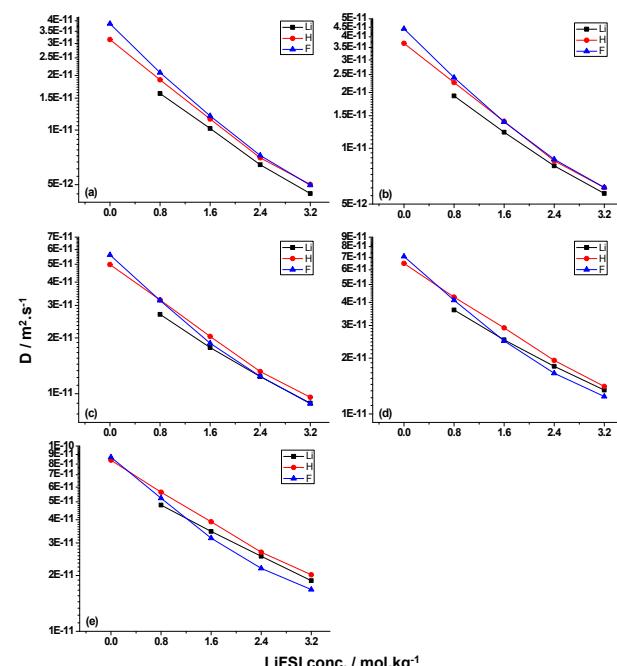
Physical properties of high Li-ion content *N*-propyl-*N*-methylpyrrolidinium bis(fluorosulfonyl)imide based ionic liquid electrolytes: Supplementary figures

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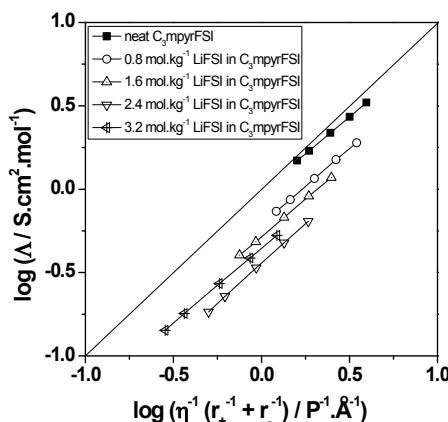
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Supplement Figure 1 Diffusivities of Li^+ , C_3mpyr and FSI ions measured using PFG-STE NMR by salt concentration (a) at 25°C , (b) at 30°C , (c) at 40°C , (d) at 50°C , (e) at 60°C .

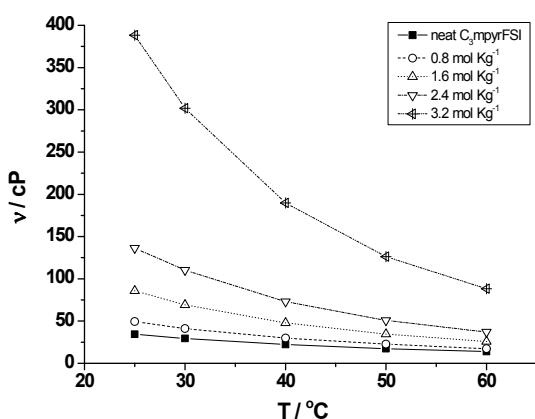
Supplement Table 1 FT-IR Peak positions (ν : stretching, δ : bending) from L. J. Hardwick, J. A. Saint, I. T. Lucas, M. M. Doeff and R. Kostecki, *J. Electrochem. Soc.*, 2009, **156**, A120-A127

vibrational mode	neat $\text{C}_3\text{mpyrFSI}$	0.8 mol.kg^{-1} LiFSI in IL	1.6 mol.kg^{-1} LiFSI in IL	2.4 mol.kg^{-1} LiFSI in IL	3.2 mol.kg^{-1} LiFSI in IL
$\nu\text{CH}_2\text{C}_3\text{mpyr}$	2980	2981	2982	2982	2983
$\nu\text{CH}_2\text{C}_3\text{mpyr}$	2889	2889	2890	2890	2891
$\delta\text{CH}_2,\text{CH}_3\text{C}_3\text{mpyr}$	1469	1469	1469	1469	1469
$\delta\text{CH}_2\text{C}_3\text{mpyr}$	1433	1433	1433	1432	1432
$\nu_{as}\text{SO}_2$	1376	1376	1376	1375	1374
$\nu_{as}\text{SO}_2$	1359	1359	1358	1358	1357
$\nu_s\text{SO}_2$	1217	1217	1218	1219	1220
$\nu_s\text{SO}_2$	1171	1170	1170	1168	1168
FSI(?)	1100	1105	1109	1112	1114
Ring mode C_3mpyr	1003	1003	1003	1003	1003
	970	970	970	970	970
	939	939	939	939	939
	905	905	905	905	905
$\nu_{as}\text{SNS}$ and νSF	826	830	835	839	841
$\nu_s\text{SNS}$	730	736	741	744	746
δSNS	641	644	645	648	648
$\delta_a\text{SO}_2$	564	565	566	567	566



Supplement Figure 4 Reciprocal viscosity vs. Li diffusion coefficient plot of C₃mpyrFSI at 25 °C and 60 °C

Supplement Figure 2 Modified Walden plot, Atomic radius from ‘MacFarlane, D. R.; Forsyth, M.; Izgorodina, E. I.; Abbott, A. P.; Annat, G.; Fraser, K., Phys. Chem. Chem. Phys. 2009, 11 (25), 4962-4967.’



Supplement Figure 3 Viscosity plot of C₃mpyrFSI with different LiFSI salt concentrations.

