Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Enhanced low-temperature ionic conductivity via different Li^+ solvated clusters in organic solvent/ionic liquid mixed electrolytes

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Supplementary information

Table S1. Glass transition temperature (T_g) of the 0.8m LiTFSI $[EC:DMC(1:1)]_{(1-x)}[Pyr_{14}TFSI]_x$ mixtures.

0.8m LiTFSI in $[EC:DMC]_{(1-x)}/[Pyr_{14}\text{-}TFSI]_x$	
wt fraction (**x**)	T_g (°C)
x=0	-104
x=0.19	-102
x=0.33	-97
x=0.46	-93
x=0.56	-91
x=0.76	-83
x=1	-67

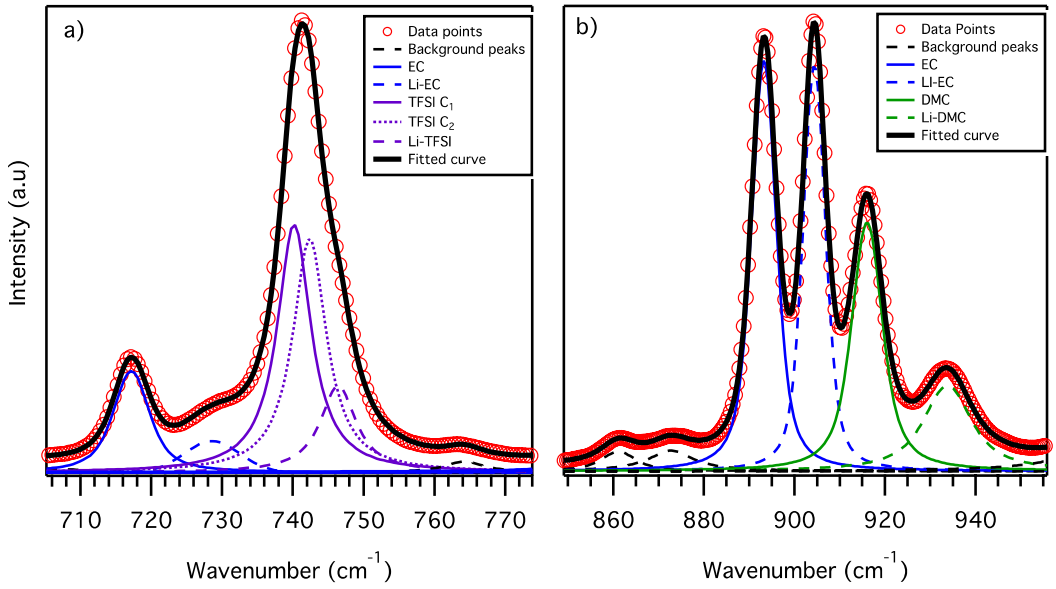

Figure S1. Example of peak assignment and fitted Raman spectra of the two regions of interest a) from 700 to 800 cm^{-1} where TFSI solvation features are studied and b) from 850 to 950 cm^{-1} where information about the organic solvent is present. The spectra correspond to an IL fraction of x=0.46.

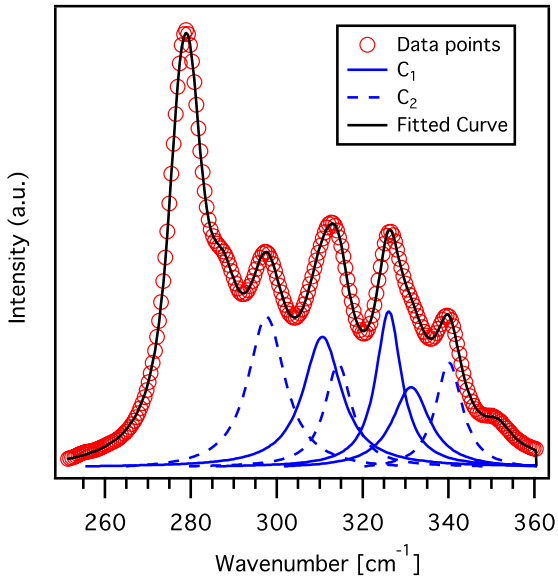

Figure S2. Peak assignment and fitted Raman spectra used to determine the population of the C_1 and C_2 conformers from the $TFSI^-$. The spectra correspond to to an IL fraction of x=0.46.

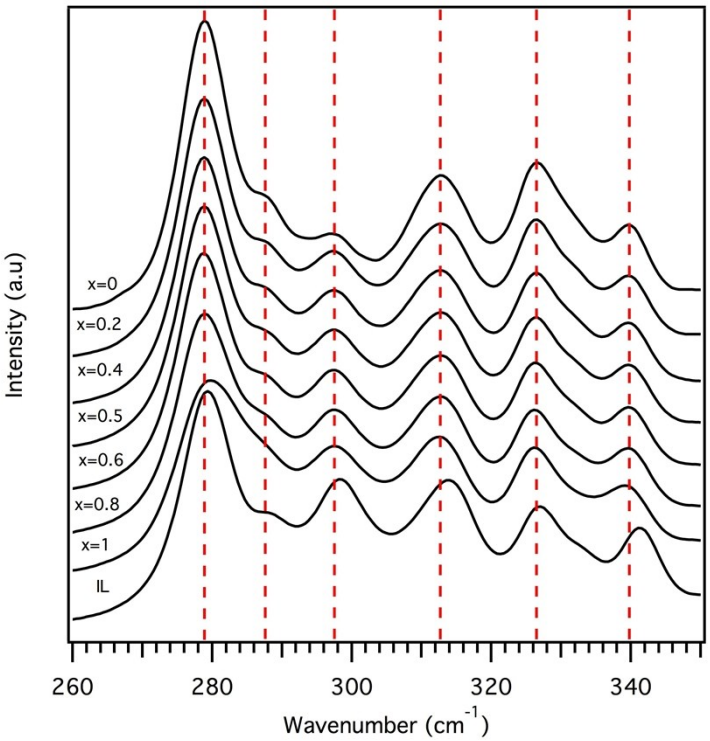

Figure S3. Evolution of the peaks representing the conformers population of the $TFSI^-$, for 0.8m LiTFSI in $[EC:DMC]_{(1-x)}/[Pyr_{14}\text{-}TFSI]_x$ mixtures. The spectra have been normalized with respect to intensity and offset vertically for clarity.