

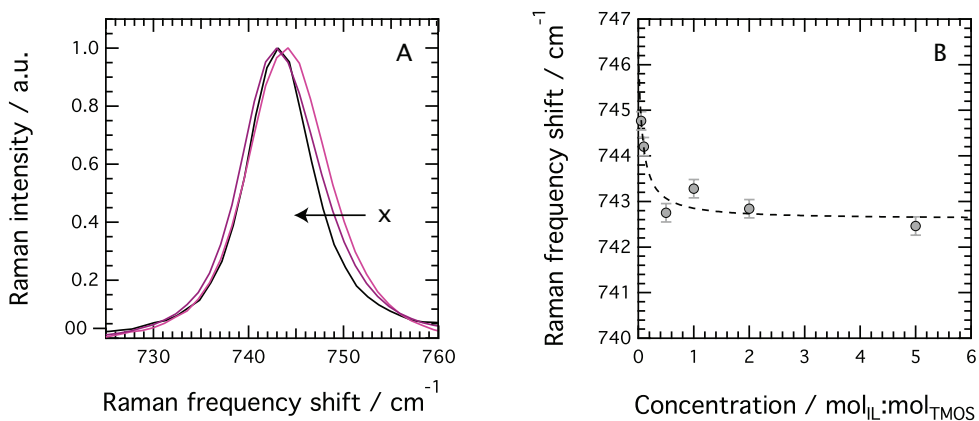
### Electronic Supplementary Information 3:

## Surface effects on the structure and mobility of the ionic liquid $C_6C_1ImTFSI$ in silica gels

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### Raman peak fit analysis

The following figures show and explain the fit procedure of analysing the recorded Raman spectra.



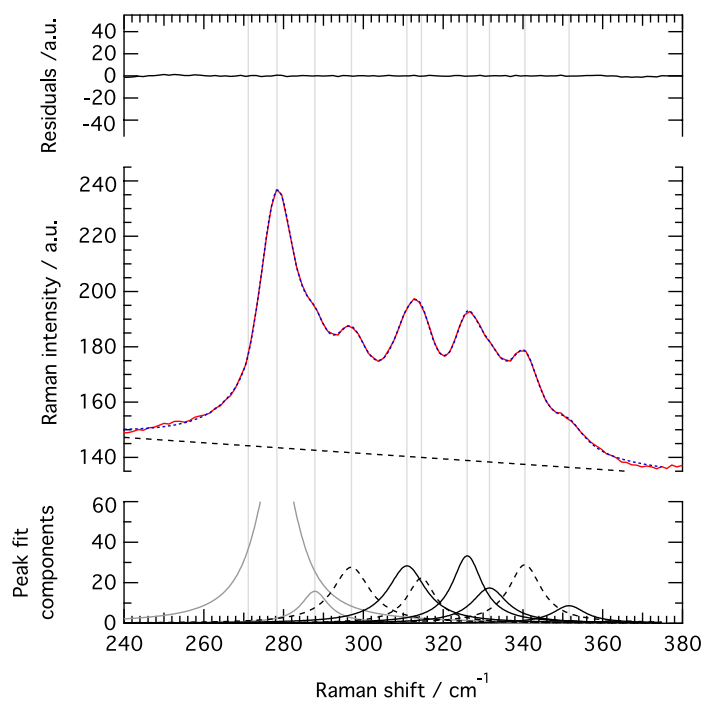
**Fig. 1** A: Close-up of the spectral range 725–760 cm<sup>-1</sup> where the expansion-contraction mode of the TFSI anion is found. From left to right Raman spectra of the ionogels corresponding to x=1, x=0.1, and x=0.05 are shown to evidence the peak shift towards higher frequencies as the ionic liquid concentration is reduced. B: Frequency shift as a function of ionic liquid concentration, x, as found when peak-fitting the broad feature at 740 cm<sup>-1</sup> with one single component.

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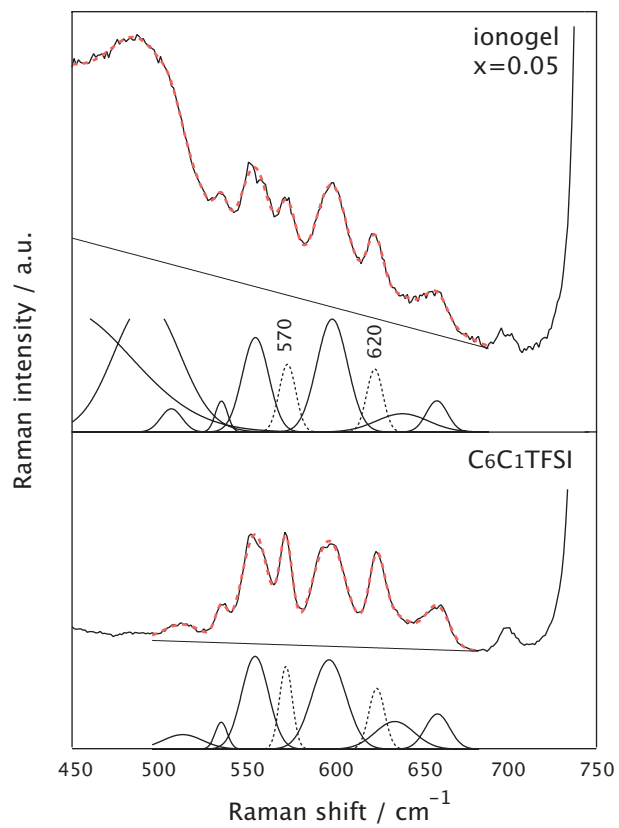
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**Fig. 2** Peak fit procedure for the conformational sensitive range 240-380  $\text{cm}^{-1}$  for the TFSI anion. The red line shows the experimentally recorded Raman spectrum, the black short dotted line represents the peak fit result, while the  $C_1$  and  $C_2$  conformers are shown as solid and dashed lines respectively (see bottom part of the figure).



**Fig. 3** Peak fit analysis of the conformational sensitive range of 500-700 cm<sup>-1</sup> for the cation C<sub>6</sub>C<sub>1</sub>Im<sup>+</sup>. Top: ionogel with  $x = 0.05$ , bottom the bulk ionic liquid C<sub>6</sub>C<sub>1</sub>ImTFSI.