

Supplementary Information

Lithium coordination in protic ionic liquids

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SI1

Table 1.

Conductivity and viscosity at 30°C of binary mixtures containing PYR₁₄TFSI, PYR_{H4}TFSI and PYR_{HH}TFSI and the lithium salt LiTFSI.

| | Conductivity / mS cm ⁻¹ | | | | Viscosity / mPa s | | | |
|------------------------|------------------------------------|-------------|-------------|-------------|--------------------|-------------|-------------|-------------|
| | <i>molar ratio</i> | | | | <i>molar ratio</i> | | | |
| | <i>0.06</i> | <i>0.08</i> | <i>0.09</i> | <i>0.11</i> | <i>0.06</i> | <i>0.08</i> | <i>0.09</i> | <i>0.11</i> |
| PYR _{HH} TFSI | 3.0 | - | - | 2.2 | 86.9 | - | - | 123.1 |
| PYR _{H4} TFSI | - | 2.9 | - | - | - | 69.5 | - | - |
| PYR ₁₄ TFSI | - | - | 2.5 | - | - | - | 87.6 | - |

These mixtures have been considered in Fig. 3

SI2

Table2

Comparison of the peak wavenumber assigned to the “free” TFSI⁻ of various aprotic ionic liquids.

| Ionic liquid | Peak wavenumber / cm ⁻¹ | Reference |
|---------------------------------------|------------------------------------|-----------|
| BMITFSI | 742 | [26] |
| EMITFSI | 742±1 | [7] |
| | 742 | [27] |
| PYR ₁₃ TFSI | 742 | [28] |
| PYR _x TFSI (x=3,4,5,6,7,8) | 742.3±0.2 | [23] |
| PYR _{1[20x]} TFSI (x=1,2) | 742.2 | [16] |

References (from the text)

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