

Ionic Liquids: Simple or Complex Electrolytes?

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Paper presented as a key-note lecture at the 25th Annual Meeting of the Slovenian Chemical Society, Maribor, 25. – 27. 9. 2019 and dedicated to the memory of Professor Josef Barthel, who passed away in February 2019.

Supplementary data

Table S1. Fitted values of the empirical parameters, κ_{max} , $x_{IL,max}$, m and n according to the empirical Castel-Amis equation (equation 2 in the main paper) as obtained by the fitting procedure on the literature data for different ILs in some solvents.^a

| | x_{max} | $\kappa_{max}/S \cdot m^{-1}$ | m | n | $s/S \cdot m^{-1}$ |
|---|-----------|-------------------------------|---------|--------|--------------------|
| water | | | | | |
| [C₂mim]Cl | 0.0715 | 8.948 | 8.939 | 0.8010 | 0.514 |
| [C₄mim]Cl | 0.0572 | 6.452 | 8.864 | 0.7803 | 0.225 |
| [C₆mim]Cl | 0.0560 | 5.586 | 1.832 | 0.7663 | 0.295 |
| [C₈mim]Cl | 0.0529 | 5.131 | 5.555 | 0.7818 | 0.064 |
| AN | | | | | |
| [C₂mim]BF₄ | 0.1709 | 6.9831 | 1.0344 | 0.7095 | 0.045 |
| [C₄mim]BF₄ | 0.1182 | 5.2148 | 1.4812 | 0.7030 | 0.018 |
| [C₆mim]BF₄ | 0.0930 | 4.2736 | 2.5536 | 0.7267 | 0.020 |
| TBABr | 0.0451 | 2.2090 | 13.4204 | 0.7693 | 0.00005 |
| [C₄mim]BF₄ | | | | | |
| AN | 0.1182 | 5.215 | 1.4813 | 0.7030 | 0.01815 |
| MetOH | 0.1573 | 4.2834 | 0.616 | 0.7663 | 0.00655 |
| PC | 0.1865 | 1.3584 | 1.1897 | 0.7773 | 0.00042 |
| DMSO | 0.1444 | 1.7260 | 2.6119 | 0.8180 | 0.0016 |
| DCM | 0.2441 | 1.6304 | 1.2190 | 1.3003 | 0.00545 |

^aUnits: κ_{max} , $S \cdot m^{-1}$; s , $S \cdot m^{-1}$

Table S2. Coefficients A, B and C obtained from the polynomial fit $cmc=A+BT+CT^2$ for

| | A | B | 10³ C |
|--------------------------------|---------------------|--------------------|-------------------------|
| [C₁₂im]Bz | 131.52319 ± 1.20298 | -0.85462 ± 0.00808 | 1.43571 ± 0.01355 |
| [C₁₂im]o-HBz | 41.89402 ± 9.38702 | -0.28707 ± 0.06307 | 0.514286 ± 0.105753 |
| [C₁₂im]m-HBz | 71.12132 ± 12.47599 | -0.48247 ± 0.08383 | 0.864286 ± 0.140553 |
| [C₁₂im]p-HBz | 128.6240 ± 7.4373 | -0.85437 ± 0.04997 | 1.47857 ± 0.08379 |

^aUnits: T/K; A/mM, B/mM·K⁻¹; C/mM·K⁻²