

SUPPORTING INFORMATION.

SANS Study on Solvated Structure and Molecular Interactions of a Thermo-responsive Polymer in a Room Temperature Ionic Liquid.

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Table S1

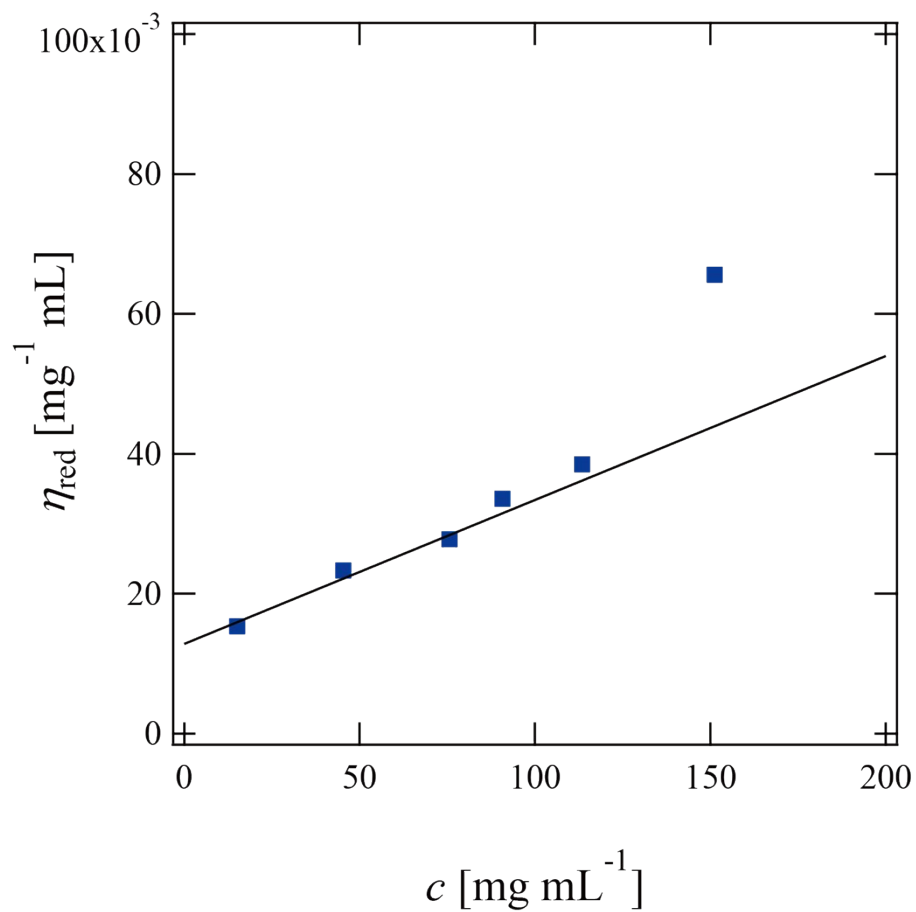
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The obtained density values of $[\text{C}_2\text{mIm}^+][\text{TFSA}^-]$, $d_8\text{-}[\text{C}_2\text{mIm}^+][\text{TFSA}^-]$, PhEtMA (monomer) at 298 K.

Component	Density [g cm^{-3}]
$[\text{C}_2\text{mIm}^+][\text{TFSA}^-]$	1.5180
$d_8\text{-}[\text{C}_2\text{mIm}^+][\text{TFSA}^-]$	1.5512
PhEtMA	1.0174

Figure S1.

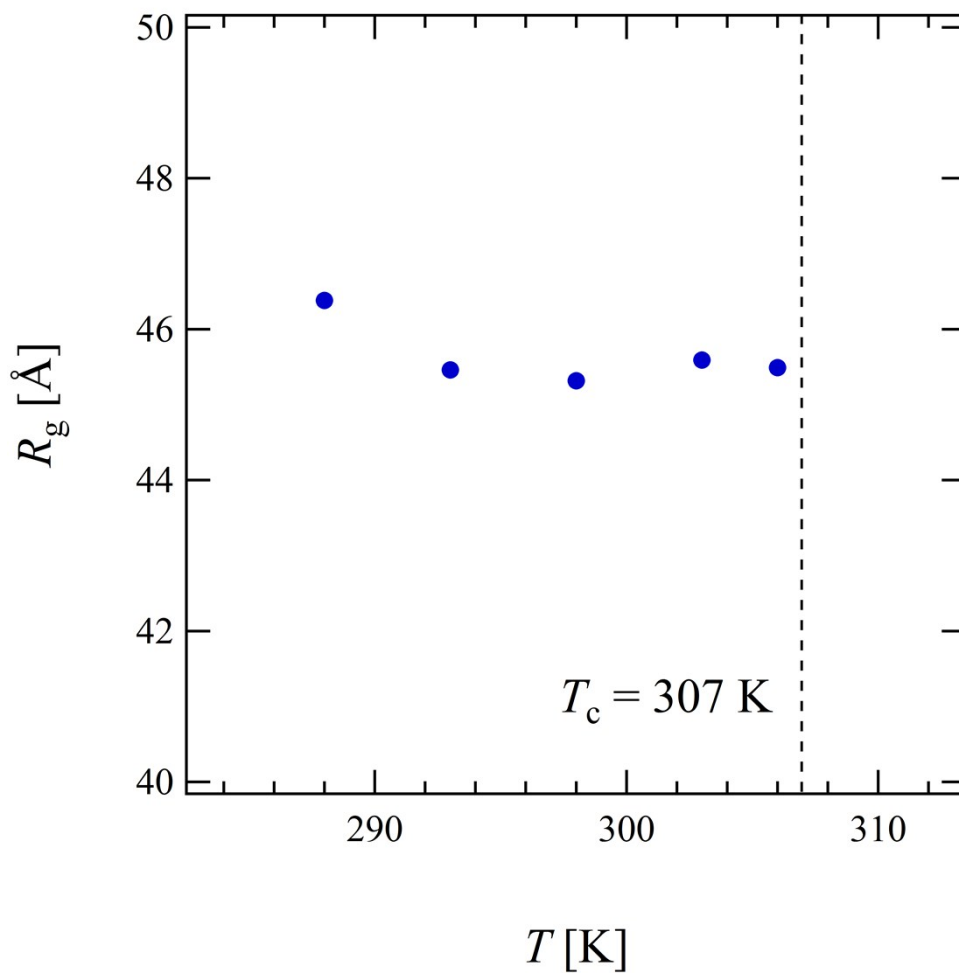
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Concentration dependence of the reduced viscosities (η_{red}) of PBnMA ($M_n = 40$ kDa, $M_w/M_n = 1.12$) / $[\text{C}_2\text{mIm}^+][\text{TFSA}^-]$ solutions. The intrinsic viscosities ($[\eta]$) were obtained by extrapolating η_{red} to $c = 0$ (solid line). The c^* was estimated to be approximately 100 mg mL^{-1} .

Figure S2.

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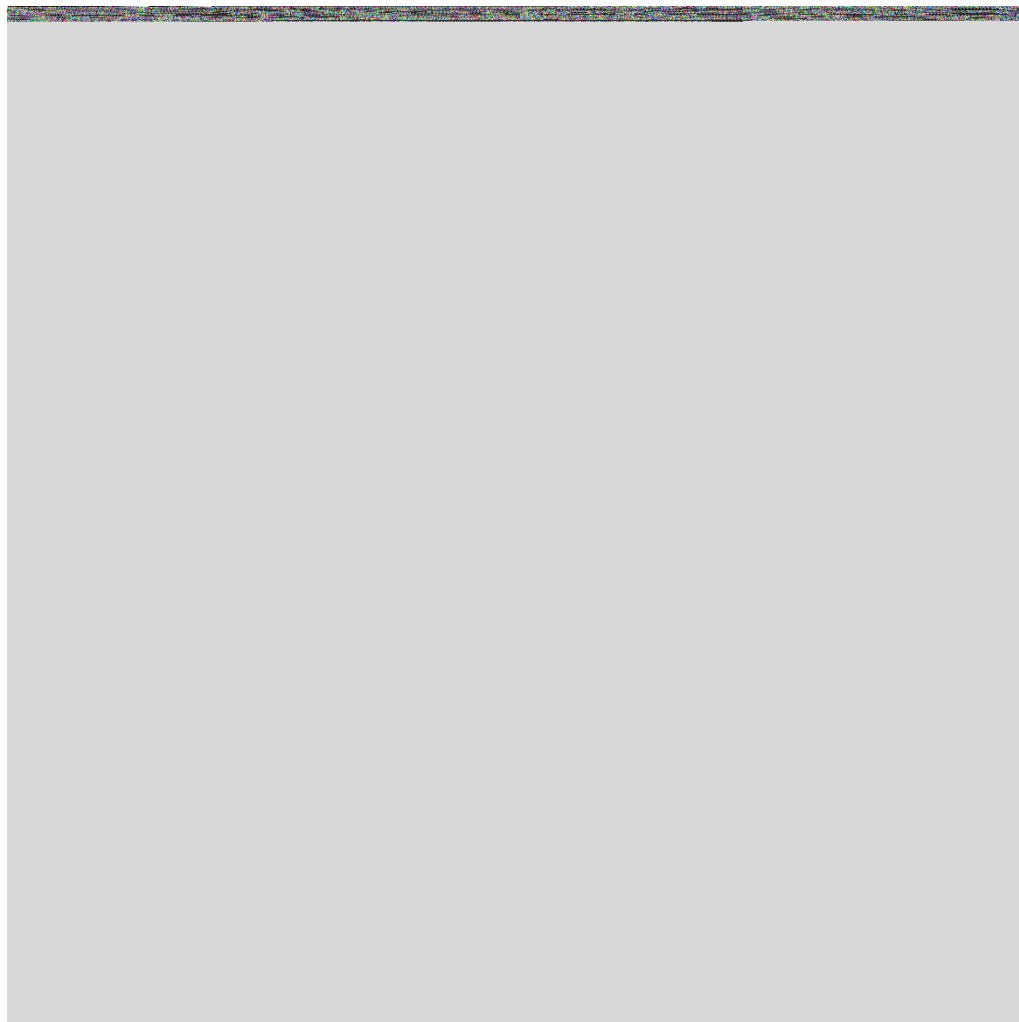
The comparison of the temperature dependence of the effective interaction parameter, χ_{eff} of PPhEtMA in $[\text{C}_2\text{mIm}^+][\text{TFSA}^-]$ solution obtained from curve fitting by eq. (3) with that calculated from the second virial coefficient, A_2 by following equation;

$$A_2 = \frac{V_0}{2m^2} (1 - 2\chi_{\text{eff}}), \quad \left(m \equiv \frac{M}{v_1/v_0} \right)$$

where V_0 and M are the molar volume of the solvent and the molecular weight of polymer, respectively. v_1 and v_0 are the volumes of the polymer and of the solvent, respectively. A_2 value can be obtained by Zimm plot.

Figure S3.

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Temperature dependence of the radius of gyration (R_g) of dispersed PPhEtMA chains in d_8 -[C₂mIm⁺][TFSA⁻] solution ($c = 16 \text{ mg mL}^{-1}$) obtained from a curve fitting for SANS profiles at various temperatures. We use Eq. 3 at $T < 307 \text{ K}$ and Eq. 4 at $T = 310 \text{ K}$ as a fitting function.