


(※本報告書は英語で記述してください。ただし、産業利用課題として採択されている方は日本語で記述していただいても結構です。)

	提出日 Date of Report 8/27/2012
課題番号 Project No. 2012A0132 実験課題名 Title of experiment Nano- and micro-scale structures of poly(ethylene glycol)/IL solutions and their iongels 実験責任者名 Name of principal investigator Kenta Fujii 所属 Affiliation The University of Tokyo	装置責任者 Name of responsible person Junichi Suzuki 装置名 Name of Instrument/(BL No.) BL-15 Smaller-Angle Neutron Scattering Instrument (TAIKAN) 実施日時 Date and time of Experiment 6/17 - 6/19

試料、実験方法、利用の結果得られた主なデータ、考察、結論等を、記述して下さい。(適宜、図表添付のこと)
Please report your samples, experimental method and results, discussion and conclusions. Please add figures and tables for better explanation.

1. 試料 Name of sample(s) and chemical formula, or compositions including physical form. poly(ethylene glycol) / IL solution solvent : ionic liquid (IL) = d8-1-ethyl-3-methylimidazolium bis(trifluoromethanesulfonyl)amide solute (polymer) : poly(ethylene glycol) Molecular weight of poly(ethylene glycol) : 600, 2000, 4600, 10000 g/mol Polymer concentrations: 10, 20, 30 wt%
--

2. 実験方法及び結果 (実験がうまくいかなかった場合、その理由を記述してください。) Experimental method and results. If you failed to conduct experiment as planned, please describe reasons. Small-angle neutron scattering (SANS) measurements for room-temperature ionic liquid, 1-ethyl-3-methylimidazolium bis(trifluoromethanesulfonyl)amide (d8-[C2mIm+][TFSA-]) containing poly(ethylene glycol) were carried out by using TAIKAN at 298 K. The ionic liquid, d8-[C2mIm+][TFSA-] examined here was synthesized in our laboratory. SANS profiles (raw data) were corrected for background using an empty cell (total counts: 1,000,000, measurement time: 12 h). Figure 1 shows the structure factor, S(Q) observed in the Q-range of 0.02 - 2 Å ⁻¹ , for 10 wt% poly(ethylene glycol) in d8-[C2mIm+][TFSA-], which is a typical result in this experiment. As can be seen in this figure, it is found that the peaks are observed at around Q = 0.1 and 1.2 Å ⁻¹ and the valley at 0.5 Å ⁻¹ , which is consistent with the corresponding scattering data measured at SANS-U (JRR-3, JSPS, U of Tokyo) and SPring-8 (high-energy X-ray diffraction, BL04B2 beamline). However, data quality (S/N) was seriously wrong in this experiment. This is mainly ascribed to a low polymer concentration of the sample solution, i.e., the scattering length density difference between the solute and the solvent, $\Delta \rho$ is not enough in SANS experiment by TAIKAN. This result implies that application of TAIKAN to a dilute polymer solution system is difficult at the present stage.

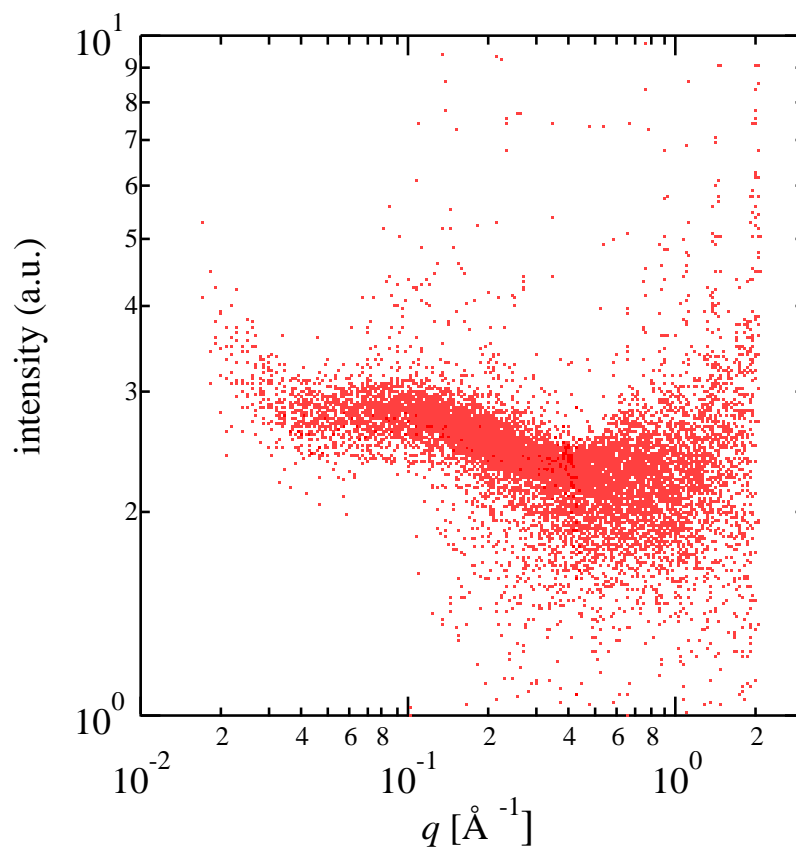


Figure 1. Structure factor, S(Q) observed for 10 wt% poly(ethylene glycol) in d8--[C2mIm+][TFSA-] solution.