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学位（博士）論文要旨

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論 文 題 目	Design of polymerized ionic liquids showing highly thermosensitive LCST-type phase transition in water.

論文要旨

This thesis mentioned the design of polymerized ionic liquids (PILs) to show temperature-sensitive lower critical solution temperature (LCST)-type phase transition in water and the chemical control of their transition. Through the examination, it was achieved to obtain PILs showing highly thermosensitive LCST-type phase transition in water at a desired temperature. Chapter 1 gave a general introduction of conventional non-ionic polymer showing LCST-type phase transition with water, thermoresponsive IL, and PIL. Then the objective of this thesis was also outlined. In Chapter 2, the phase behavior of the ILs monomer and the resulting PILs was evaluated. In addition, the aggregation state of PIL in water was analyzed by various methods. Some IL monomers showed LCST-type phase transition with water and the thermoresponsivity was confirmed to be maintained after polymerization. Consequently, the polymer was found to aggregate in the water even in the under the phase transition temperature. In Chapter 3, the factors to control the phase transition temperature of PIL/water mixtures were discussed. It was confirmed that the phase transition temperature of the PIL/water mixture can be controlled by some methods such as adjusting the PIL concentration, adding an inorganic salt, and copolymerizing monomers having different hydrophilicity. In addition, it was clarified that the phase behavior with water could be controlled by blending PILs with different hydrophilicity. It was clearly confirmed that it is possible to give a temperature response to PILs that are not showing the LCST-type phase transition by adjusting the hydrophilic and hydrophobic properties within an appropriate range by blending. In Chapter 4, based on the obtained results, the preparation method of the thermoresponsive hydrogel using IL monomer was examined. In the end, the author successfully prepare fully charged hydrogel showing LCST-type phase transition. The obtained hydrogel was able to absorb/desorb water continuously according to temperature.