Frontier Chemistry Center
フロンティア化学教育研究センター 講演会

演 題：**New Functional Aliphatic Polyethers, Polyisocyanates, and Their Block Copolymers**

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場 所：工学部材料・化学棟中会議室（MC102）

要 旨：Well-defined and selectively functionalizable linear aliphatic diblock copolyethers were successfully synthesized without any side reactions from allyl glycidyl ether and ethoxyethyl glycidyl ether by low-temperature anionic ring-opening polymerization with a metal-free catalyst system via sequential step feed of the comonomers. Each block of the diblock copolyether selectively underwent deprotection and post chemical functionalizations. Moreover, the diblock copolyethers underwent phase-separation and molecular ordering, and formed various nanostructures, depending on the compositions and selective post chemical modifications. This new family of block copolymers demonstrated to be a versatile linear aliphatic polyether platform for selective functionalizations and various nanostructures. In addition, we would like to report for the first time conformational and structural details of peptide-mimic poly(*n*-hexyl isocyanate) (PHIC), a representative of poly(*n*-alkyl isocyanate)s which have received significant attention because of their unique stiff chain characteristics and potential applications in various fields. A well-ordered hexagonal close packing structure of PHIC with 8_3 helical conformation was nicely demonstrated in the nanoscale thin films annealed selectively with carbon disulfide. A well-ordered multibilayer structure of the polymer with β-sheet conformation was also nicely formed in the films annealed selectively with toluene. Moreover, a fully reversible transformation between these two self-assembled structures was demonstrated by consecutive annealing with carbon disulfide and toluene. Moreover, multi-arm systems based on PHIC and with aliphatic polyesters will be introduced and discussed in views of chemical nature, phase-separation, crystallization and resulting morphological structures.

本講演は、大学院総合化学院『化学研究先端講義／総合化学特別研究第二』の一部として認定されています。

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