

論文名：構造の明確な共有結合ポリマーからの構造の制御された超分子ポリマーの合成と
キャラクタリゼーション (要約)

Title of Doctoral Thesis:

Synthesis of well-controlled supramolecular polymers from well-defined covalent polymers and
their characterization.

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(以下要約を記入する)

In general, supramolecular polymers (SPs) whose repeating units connect with secondary bonds such as hydrogen bonds and π - π stacking are synthesized by supramolecular polymerizations of small molecules as their thermodynamically stable molecular assemblies. Therefore, the stability and strength of SPs are low and the design and control of the chemical structures are not easy.

We previously developed a new synthetic reaction (SCAT reaction) of one of pure SPs directly from conventional polymers (CPs) whose repeating units connect with covalent bonds. In these pure SPs by the SCAT reaction, the repeat units, 1,3,5-triphenylbenzene derivative, connected each other by π - π stacking and multiple hydrogen bonds. Therefore, the resulting SPs from self-supporting membranes of the corresponding precursor polymer has still maintained self-supporting membrane property in spite of one of pure SPs.

Since the main chain structures of CPs are stable and can be synthesized in kinetically controlled polymerizations such as living polymerizations and helix-sense-selective polymerizations, their microstructures can be controlled. Therefore, a variety of well-defined SPs can be synthesized by the SCAT reaction of well-defined CPs.

PART 01 of this thesis described the synthesis method, characterization and oxygen permselectivity of supramolecular net-worked polymers.

PART 02 of this thesis described the synthesis method, characterization and oxygen permselectivity of supramolecular block copolymers.

PART 03 of this thesis described the synthesis method, characterization and oxygen permselectivity of supramolecular and covalent block copolymers.

PART 04 of this thesis described the synthesis method, characterization and oxygen permselectivity of supramolecular homopolymers.