

論文 / 著書情報
Article / Book Information

題目(和文)	アレン類のリビング配位重合による精密分散重合の開拓とこれに基づく機能性高分子ミクロスフェアおよびナノ構造体の構築
Title(English)	Development of Precision Dispersion Polymerization Based on Allylnickel-Catalyzed Living Coordination Polymerization of Allene Derivatives and Its Application to Functional Cross-linked Microspheres and Nanostructured Materials
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出典(和文)	学位:博士(工学), 学位授与機関:東京工業大学, 報告番号:甲第10331号, 授与年月日:2016年9月20日, 学位の種別:課程博士, 審査員:富田 育義,稲木 信介,福島 孝典,田中 浩士,布施 新一郎
Citation(English)	Degree:., Conferring organization: Tokyo Institute of Technology, Report number:甲第10331号, Conferred date:2016/9/20, Degree Type:Course doctor, Examiner:,,,,,
学位種別(和文)	博士論文
Category(English)	Doctoral Thesis
種別(和文)	要約
Type(English)	Outline

On the basis of the π -allylnickel-catalyzed living coordination polymerization of allene derivatives, the author has described the development of precision dispersion polymerization and its application to functional cross-linked polymer microspheres and nanostructured materials. This thesis consists of 6 chapters, and the outline for each chapter is shown as follows.

In Chapter 1, the research background related to the dispersion polymerization method and the allylnickel-catalyzed living coordination polymerization is described.

In Chapter 2, the precision synthesis of well-defined cross-linked polymer microspheres by the π -allylnickel-catalyzed living coordination one-shot and sequential copolymerization of a bisallene under the dispersion copolymerization conditions is described.

In Chapter 3, the precision surface functionalization of cross-linked polymer microspheres was performed by the post-polymerization of functional allene monomers on the surface of the “living” cross-linked polymer microspheres.

In Chapter 4, applications of the cross-linked polymer microspheres in organic synthesis such as the solid-phase synthesis and solid-supported catalyst are described. In Section 1, the solid-phase synthesis of biaryl derivatives was performed by using the Suzuki-Miyaura cross-coupling reaction of phenylboronic acid and aryl iodide attached to the surface-functionalized cross-linked polymer microspheres. In Section 2, the development of precision heterogeneous transition metal catalysts such as Pd supported on the well-defined cross-linked polymer microspheres was performed. The catalytic activity of the polymer-supported Pd catalysts thus obtained was also evaluated in the cross-coupling reactions.

In Chapter 5, the synthesis and applications of cross-linked nanostructures are described.

In Chapter 6, the author has summarized the works described in Chapters 2-5, and described the future perspectives.