所属：小山工業高等専門学校　物質工学科

研究タイトル：・高機能透明樹脂の合成
・エラストマーの精密合成

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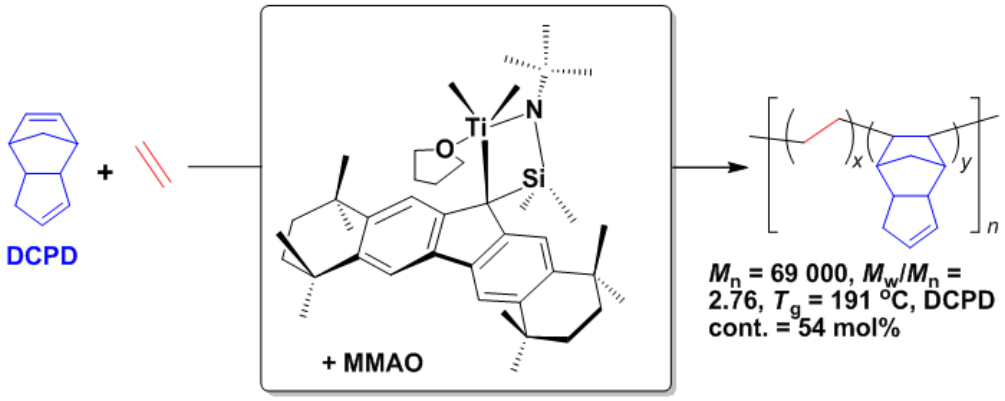
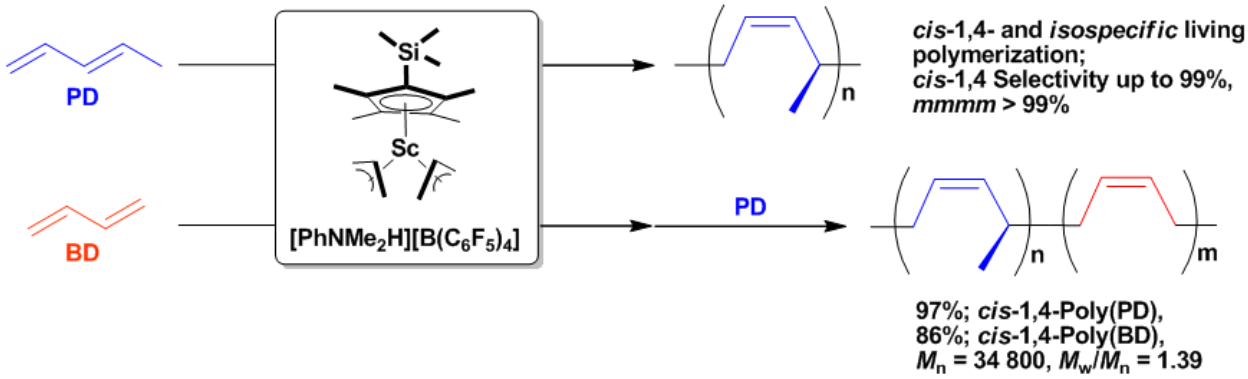
キーワード：	高分子合成，リビング重合，立体特異性重合，重合触媒，高機能透明樹脂，エラストマー
技術相談 提供可能技術：	・重合触媒の性質・合成 ・高機能透明樹脂の合成 ・エラストマーの合成

研究内容：1．高耐熱樹脂の合成　2．ペンタジエンの立体特異的，位置選択的重合



A new titanium complex was synthesized and applied for ethylene-dicyclopentadiene copolymerization using modified methylaluminoxane (MMAO) as a cocatalyst at 50 ℃. This catalyst system exhibited the remarkable catalytic activity for the copolymerization and gave a copolymer with high glass-transition temperature of 191 ℃. (*Chem. Lett.*, 2008, ***37***, 590-591. 特開2008-255341)



The living isospecific-*cis*-1,4-polymerization and block-copolymerization of (*E*)-1,3-pentadiene with 1,3-butadiene have been achieved for the first time by using cataionic half-sandwich scandium catalysts. (*Dalton Trans.*, 2013, ***42***, 9030-9032. 特願2012-168978)

提供可能な設備・機器：

名称・型番（メーカー）	
・グローブボックス（酸素濃度計，露点計付）: UN-650L, UNICO	・ガラス器具乾燥機: SOFW-300, AS ONE
・グローブボックス用ガス循環精製装置: MF-70, UNICO	・減圧乾燥機（ポリマー乾燥用）: VOS-201SD, EYELA
・低温恒温槽（-80－0 ℃）: PSL-1810, EYELA	
・低温恒温槽（-40－0 ℃）: PSL-1400, EYELA	
・高真空ガラス製マニホールド	

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Precise synthesis of cycloalkene copolymers and elastomers

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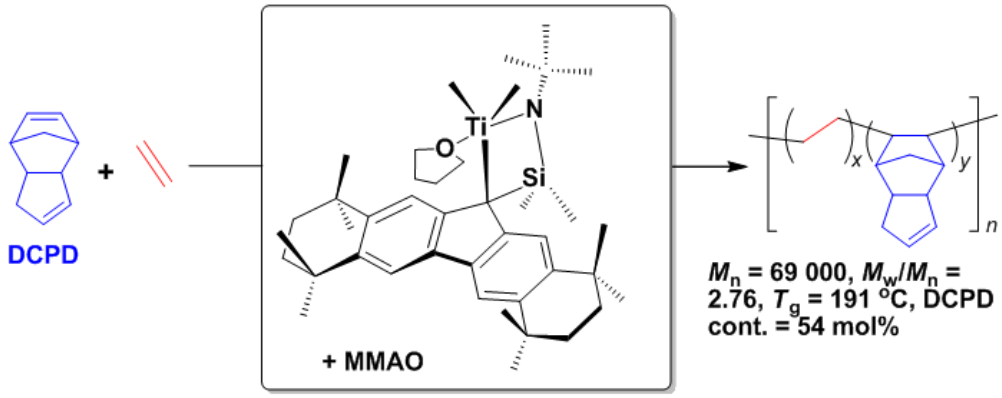
Keywords	cycloalkene, elastomer, living polymerization, catalyst, stereospecific

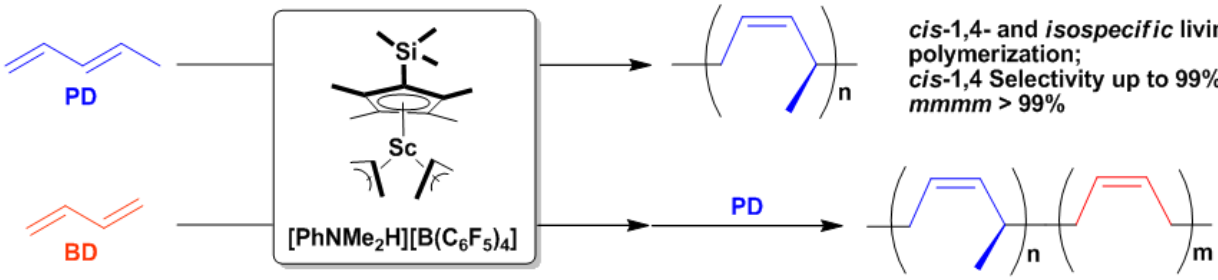
Technical Support Skills	· Synthesis of cycloalkane copolymers · Synthesis of conjugated diene polymers

Research Contents



M_n = 69 000, M_w/M_n = 2.76, T_g = 191 °C, DCPD cont. = 54 mol%

A new titanium complex was synthesized and applied for ethylene-dicyclopentadiene copolymerization using modified methylaluminoxane (MMAO) as a cocatalyst at 50 ℃. This catalyst system exhibited the remarkable catalytic activity for the copolymerization and gave a copolymer with high glass-transition temperature of 191 ℃. (*Chem. Lett.*, 2008, ***37***, 590-591.)



***cis*-1,4- and *isospecific* living polymerization; *cis*-1,4 Selectivity up to 99%, *mmmm* > 99%**

97%; *cis*-1,4-Poly(PD), 86%; *cis*-1,4-Poly(BD), M_n = 34 800, M_w/M_n = 1.39

The living isospecific-*cis*-1,4-polymerization and block-copolymerization of (*E*)-1,3-pentadiene with 1,3-butadiene have been achieved for the first time by using cataionic half-sandwich scandium catalysts. (*Dalton Trans.*, 2013, ***42***, 9030-9032.)

Available Facilities and Equipment

# Glove Box: UN-650L + MF-70, UNICO	
# Low Temp. Bath (range: -80－0℃): PSL-1810, EYELA	
# Low Temp. Bath (range: -40－0℃): PSL-1400, EYELA	
# Vacuum Drying Oven: VOS-201SD, EYELA	
# Vacuum Manifold (glassware)	