聚合物合成与制备 Polymer Synthesis and Preparation

- 教师介绍 Faculty

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Research Field: Polymer Chemistry, Coordination Polymerization

Education

September, 1999– June, 2003:
Beijing University of Chemical Technology, Beijing, China
BS in Applied Chemistry
September, 2003 – October, 2008:
Institute of Chemistry, Chinese Academy of Sciences, Beijing, China
PhD in Polymer Chemistry and Physics

Work Experience

October, 2008 – March, 2010 JSPS Postdoctor
Nara Institute of Science and Technology, Nara, Japan
April, 2010 – October, 2010 JSPS Postdoctor
Tokyo Metropolitan University, Tokyo, Japan
October, 2010 – December, 2010 Research Assistant
January – present: Associate Professor
College of Material Science and Engineering, Beijing University of Chemical Technology, Beijing, China

Representative Publications

（1） Xiaoxian Xue, Li Tian, Song Hong, **Shu Zhang***, Yixian Wu*, Eff ects of Composition and Sequence of Ethylene-Vinyl Acetate Copolymers on Their Alcoholysis and Oxygen Barrier Property of 3 Alcoholyzed Copolymers, *Ind. Eng. Chem. Res.*, 2019, 58, 4125−4136.

（2） **Shu Zhang#**, Wen-Chao Zhang, Dan-Dan Shang, Yi-Xian Wu*. Synthesis of ultra-high

molecular weight ethylene-propylene copolymer via quasi-living copolymerization with N-heterocyclic carbene ligated vanadium complexes. *J. Polym. Sci. Part A: Polym. Chem.*, 2019, 57, 553-561.

（3） Zhi-Qian Zhang, Jun-Teng Qu, **Shu Zhang***, Qiu-Ping Miao, Yi-Xian Wu*, Ethylene/propylene copolymerization catalyzed by half-titanocenes containing monodentate anionic nitrogen ligands: effect of ligands on catalytic behaviour and structure of copolymer, *Polym. Chem.*, 2018, 9, 48-59.

（4） **Shu Zhang**#, Wenjuan Zhang#, Kotohiro Nomura*, Synthesis and Reaction Chemistry of Alkylidene Complexes With Titanium, Zirconium, Vanadium, and Niobium: Effective Catalysts for Olefin Metathesis Polymerization and Other Organic Transformations. *Adv. Organomet. Chem.*, 2017, 68, 93-136.

（5） **Shu Zhang#,** Qifeng Xing, Wen-Hua Sun*，Frustratingly synergic effect of cobalt–nickel heterometallic precatalysts on ethylene reactivity: the cobalt and its heteronickel complexes bearing 2-methyl-2,4-bis(6-aryliminopyridin-2-yl)-1H-1,5-benzodiazepines, *RSC Adv.,* 2016, 6, 72170-72176.

（6） **Shu Zhang**#,* Wenchao Zhang, Dandan Shang, Zhiqian Zhang and Yixian Wu*, Ethylene/propylene copolymerization catalyzed by vanadium complexes containing N-heterocyclic carbenes, *Dalton Trans.*, 2015, 44, 15264-15270.

（7） **Shu Zhang**#, Matthias Tamm, Kotohiro Nomura*. 1,2-C-H Activation of Benzene Promoted by (Arylimido)-vanadium(V)-Alkylidene Complexes: Isolation of the Alkylidene, Benzyne Complexes. *Organometallics*, 2011, 30, 2712-2720.

（8） **Shu Zhang**#, Kotohiro Nomura*. (Imido)vanadium complexes as efficient catalyst precursors for olefin polymerization/oligomerization. *Catal Surv Asia*, 2011, 15,127-133.

（9） Kotohiro Nomura*, **Shu Zhang**. Design of new generation vanadium complex catalysts for precise olefin polymerization. *Chem. Rev.*, 2011, 111, 2342-2362.

（10） **Shu Zhang#,** Kotohiro Nomura*. Highly efficient dimerization of ethylene by (imido)vanadium complexes containing ((2-anilidomethyl)pyridine ligands: notable ligand effect toward activity and selectivity. *J. Am. Chem. Soc.*, 2010, 132, 4960-4965.

（11） **Shu Zhang**#, Wen-Hua Sun*, Xiang Hao, Tianpengfei Xiao. Ferrous and cobaltous chlorides bearing 2,8-bis(imino)quinolines: highly active catalysts for ethylene polymerization at high temperature. *Organometallics*, 2010, 29, 1168-1173.

（12） **Shu Zhang**#, Shohei Katao, Wen-Hua Sun, Kotohiro Nomura*. Synthesis of (arylimido)vanadium(V) complexes containing (2-anilidomethyl)pyridine ligands and their use as catalyst precursors for olefin polymerization" *Organometallics*, 2009, 28, 5925-5933.

（13） **Shu Zhang**#, Suyun Jie, Qisong Shi, and Wen-Hua Sun*. Chromium(III) complexes bearing 2-imino-1,10-phenanthrolines: Synthesis, molecular structures and ethylene oligomerization and polymerization. *J. Mol. Catal. A: Chem.*, 2007, 276, 174-183.

（14） **Shu Zhang**#, Igor Vystorop, Zhenghua Tang, and Wen-Hua Sun*. Bimetallic (Fe or Co) complexes bearing 2-methyl-2,4-bis(6-iminopyridin-2-yl)-1H-1,5- benzodiazepines for ethylene reactivity. *Organometallic*s, 2007, 26, 2456-2460.

- 课程介绍 About Course

This course is mostly established for foreign MS students and it will be taught in English. It is also applicable to those Chinese MS students who are eager to improve their international perspective, fundamental knowledge in chemical reactor design and communication skills in English. This course introduces the way of synthesis and preparation of polymers material, in order that students can grip fundamental principle, understand main productions of polymer and their new synthesis way. Its content includes three parts: (1) (Chapter 1, 2) to introduce synthesis way of polymers and design of macromolecules; (2) (Chapter3) to introduce products of polymer and way of preparation; (3) (Chapter4) to introduce composite material of polymer and their preparation.

Outlines:

Chapter 1 Introduction

Chapter 2 Synthesis and design of macromolecules

1. Anionic living polymerization
2. Cationic living polymerization
3. Living free radical polymerization
4. Coordination living polymerization
5. Condensation and other step-type polymerization
6. Structure design of polymer

Chapter 3 Preparation technology of polymer material and introduction of polymer production

1. Preparation technology
2. Preparation of functional polymer material

Chapter 4 Preparation of composite material on polymer

1. Preparation of organic/inorganic hybrid material
2. Preparation of composite material on polymer

- **课程大纲 Syllabus**

Instructor: Shu Zhang

Course Code:

Hours: 48

Credits: 3.0

Prerequisites: Basic Chemistry, Polymer Chemistry

Description: This course introduces the way of synthesis and preparation of polymers material, in order that students can grip fundamental principle, understand main productions of polymer and their new synthesis way.

Textbook: None

References:

[1] Harry R. Allcok, Frederick W. Lampe, James E. Mark. Contemporary Chemistry（Gravure）, Science Press，2004

[2] Zhou Qifeng, Hu Hanjie. Polymer Chemistry, Chemical Industry Press, 2001