

Jianzhu Ju

鞠见竹

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EDUCATION

2018—

PhD in Polymer Science

Marie Skłodowska-Curie Actions

Laboratory of Soft Matter Science and Engineering

PSL research University

2014—2017

Master of Engineering in Material physics

National synchrotron radiation laboratory

University of Science and Technology of China

Main subjects:

-X-ray Diffraction

-Thermal Analysis Method and Its Application

-Scaling Concept in Polymer Physics

-Fundamentals of Synchrotron Radiation Applications

-Materials Chemistry

Advisor: Prof. Liangbin Li

Thesis Title: Fast Flow Induced Non-Equilibrium Phase Transition of Isotactic Polypropylene

2010—2014

Bachelor of Engineering in Measurement Technology and Apparatus

School of Mechanical Engineering

Dalian University of Technology

Main subjects:

-English Language, Japanese Language

-Mathematics, Physics, Chemistry

-Mechanical Engineering, Machinery Design, Mechatronics

-Computer-Aided Design (Inventor, CAD, SolidWorks)

GPA: 3.6/4

Ranking: 1/30

Thesis Title: High Speed Rheometer for the Study of Flow Induced Crystallization in Polymer Melt

EXPERIMENTAL TECHNIQUES AND SKILLS

- Preparation and characterization of chemical cross-linked polymer;
- In-situ synchrotron radiation small and wide-angle X-ray scattering (SAXS/WAXS) experiment and data processing;
- In-situ Small Angle Neutron Scattering (SANS), Dynamic Light Scattering (DLS), Fourier-Transform Infrared Spectroscopy (FT-IR), Polarized Optical Microscopy (POM) and Quantum Cascade Lasers (QCL) experiment;
- Scanning Electron Microscope (SEM), Small-Amplitude Oscillatory Shear (SAOS), Atomic Force Microscopy (AFM) and Differential Scanning Calorimetry (DSC) sample preparation and measurement;
- Research and maintenance service in large-scale research facilities: synchrotron radiation and neutron resources;
- Machinery design: Inventor and SolidWorks;
- Apparatus and mechatronics design based on LabVIEW;
- Data Processing with Origin and Python

RESEARCH EXPERIENCES

- Structural and mechanical behavior in polymer melt
Studied flow induced phase transition of polymer melt with Small and Wide-Angle X-ray Scattering (SAXS/WAXS), Small Angle Neutron Scattering (SANS) etc. Proposed a non-equilibrium phase diagram of isotactic polypropylene (iPP) to investigate the kinetic and dynamic competitions.
- Complex phase transition in cross-linked network under extension
Prepared cross-linked iPP samples with γ -irradiation and characterized the cross-linking property. Investigated complicated flow induced phase transition in cross-linked iPP due to dynamic asymmetry. Studied stress and strain induced crystallization in natural rubber under creep condition.
- Development of devices for in-situ optical and mechanical characterization
Designed and fabricated rheometer with constant stress/constant strain rate mode and controllable quenching function which can be combined with various optical characterization methods. Based on the rheometer, simulated practical industrial processing and studied the transition of flow induced structure under quenching.
- Fracture property in elastomer
Applying Diffusing wave spectroscopy (DWS), mesoscopic transition and dynamics can be investigated in detail. With the technology, characterization on different behaviors will be studied.

HONORS

- Marie Sklodowska-Curie Fellowships (Dodynet ITN), 2018
- National Scholarship, 2016
- Dalian Outstanding Graduate, 2014
- Dalian university of technology scholarship for academic excellence, 2011~2013
- Dalian university of technology scholarship for Ideological Development, 2012
- Outstanding Student Cadres, 2011 and 2013
- Outstanding volunteer of 12th Challenge-cup Extracurricular and Academic Contest, 2011
- Suzhou Industrial Park Scholarship, 2011
- First Prize in the Liaoning High School Chemistry Olympic Competition, 2009

PUBLICATIONS:

- **Jianzhu Ju**, Zhen Wang, Fengmei Su, Youxin Ji, Haoran Yang, Jiarui Chang, Sarmad Ali, Xiangyang Li, Liangbin Li, Extensional Flow-Induced Dynamic Phase Transitions in Isotactic Polypropylene, *Macromolecular Rapid Communications*. 2016.
- **Jianzhu Ju**, Fengmei Su, Zhen Wang, Xiaoliang Tang, Haoran Yang, Xiaowei Chen, Yankun Lv, Jie Lu, Nan Tian, Liangbin Li, Extension decelerated crystallization in γ -irradiated isotactic polypropylene: The role of asymmetric chain relaxation, *Polymer*. 2017.
- **Jianzhu Ju**, Nan Tian, Zhen Wang, Fengmei Su, Haoran Yang, Jiarui Chang, Xueyu Li, Sarmad Ali, Yuanfei Lin, Liangbin Li. Precursor Assisted Crystallization in Cross-Linked Isotactic Polypropylene, *Polymer*. 2019.
- Zhen Wang, **Jianzhu Ju**, Junsheng Yang, Zhe Ma, Dong Liu, Kunpeng Cui, Haoran Yang, Jiarui Chang, Ningdong Huang, and Liangbin Li, The Non-Equilibrium Phase Diagrams of Flow-Induced Crystallization and Melting of Polyethylene, *Scientific Reports*. 2016.
- Nan Tian,* Tingting Wang, Xiaoqing Tu, Yue Shui, **Jianzhu Ju**,* Guangai Sun, Dong Liu*. Cyclic tensile machine with wide speed range for in-situ neutron/X-ray scattering study on elastomers. (submitted)
- Haoran Yang, Dong Liu, **Jianzhu Ju**, Jing Li, Guanyun Yan, Guangai Sun and Liangbin Li, Influence of Chain Deformation on the Formation of Shish Nuclei and the Motion of Molecular Chain during Subsequent Crystallization under Extension Flow: An in-situ SANS, SAXS, and WAXD Study. *Macromolecules*. 2016.

- Zhen Wang, **Jianzhu Ju**, Lingpu Meng, Nan Tian, Jiarui Chang, Haoran Yang, Youxin Ji, Fengmei Su, Liangbin Li, Structural and Morphological Transitions in Extension-Induced Crystallization of Poly(1-butene) Melt. *Soft matter*. 2017.
- Fengmei Su, Youxin Ji, Lingpu Meng, Zhen Wang, Zeming Qi, Jiarui Chang, **Jianzhu Ju**, Liangbin Li. Coupling of Multiscale Orderings during Flow-Induced Crystallization of Isotactic Polypropylene, *Macromolecules*. 2017.
- Hao-ran Yang, **Jian-zhu Ju**, Jie Lu, Jia-ruì Chang, Feng-mei Su, Liang-bin Li, The Influence of Shear Homogeneity on Flow-induced Crystallization of Isotactic Polypropylene. *Acta Polymerica Sinica*. 2017. ([in Chinese](#))
- Rui Zhang, You-xin Ji, Qian-lei Zhang, **Jian-zhu Ju**, Ali Sarmad, Li-fu Li, Haoyuan Zhao, Liang-bin Li. A universal blown film apparatus for in-situ X-ray measurements, *Chinese Journal of Polymer Science*. 2017.

PATENTS:

- Ultra-fast stretching device combined with X-ray scattering and experiment method of ultra-fast stretching device. CN106769479A. 2017.
- Ultra-fast stretching device associated with the use of X-ray scattering. CN207066871U. 2018
- Creep stretching device combined with X-ray scattering and experiment method of creep stretching device. CN107063889A. 2017.
- Creep stretching device associated with the use of X-ray scattering. CN206787948U. 2017
- Blown film device combined with X-ray scattering for in-situ structure detection and experimental method. CN106738751A. 2017
- Blown film device associated with the use of X-ray scattering for in-situ structure detection. CN206937906U. 2018
- Rotational shearing device. CN110068521A. 2019