Division of Material Chemistry	Research field	Synthetic Polymer Chemistry	Lab. ID MC11
Laboratory web site	http://kohka.ch.t.kanazawa-u.ac.jp/lab5/lab5.html		

Research subjects

Our research subjects are classified into the following three topics.
・Development of Novel Chiral π–Conjugated (Macro)molecular Systems: The purpose of this study is to develop novel chiral π–conjugated (macro)molecular systems, which can detect the chirality of target molecules as changes in their absorption, luminescence, visible color, or electrical properties.
・Development of Chiral Recognition Materials through Chemical Modifications of Polysaccharides: Polysaccharides are polymer materials with a precisely controlled structure. In this research project, we intend to develop new functional polymers with chiral recognition ability through chemical modifications of these renewable resources, polysaccharides.
・Development of Photoelectric Conversion Materials: This topic is the further improvement of conversion efficiency for practical application of organic solar cells, and is being carried out in collaboration with the lab of TAKAHASHI Kohshin in the Division of Material Chemistry, and we intend to develop a practical organic solar cells.

Master/Doctor course: Education policy, curriculum, typical activity in the laboratory

Master course: We organize weekly workshops where students give presentations about the latest papers reported in the distinguished English journals. We also hold the research seminar at the end of the month, in which each student presents own research progress and discusses with the other laboratory members.
Doctor course: Students select the primary staff or research group to work with, and collaborative research works are started. Doctor students are encouraged to go for outer activities, participating research workshops/meetings, international conferences, even foreign country institutes for months.
There are a couple of foreign students in our lab, and all activities or correspondences in the laboratory are done in English.

Daily life in the laboratory, etc.

Personal working desk with a personal Macintosh computer is available for every student.
All relevant students of undergraduate, Master, Doctor and post Doc researchers share the laboratory rooms, and the free discussion on functional polymers or related topics are strongly encouraged anytime.
Many laboratory activities, such as welcome party for newcomers, excursion, laboratory trip, etc., are organized.

Message or comments by the laboratory faculty staffs

Knowledge and skills related to the polymer chemistry is necessary for developing innovative materials and will be useful for any careers after graduation. Most of the Master graduates take occupation as research laboratory staffs at chemical companies, public servants, etc. All the rest will enter the Doctor course. After taking the doctoral degree, graduates will be post doc researchers at other university, research laboratory staffs at chemical companies, etc.

Recent Master theses in these 3 years (+ more if appropriate)

year.month	Thesis title (including English translation of Japanese thesis title)
2017.3	Materials Applications of Cellulose Derivatives Based on Chemical Characters of Imidazolium Salts
2017.3	Dynamic Property Control of Helical Poly(diphenylacetylene) Derivatives through Ion Pair Formation
2017.3	Conformational Control of Optically Active Poly(diphenylacetylene) Derivatives by External Stimuli and Their Application
2017.3	Synthesis of p–Conjugated Polymers Containing Glucose–Linked Biphenyl Units in the Main Chain and Their Circularly Polarized Luminescence Properties
2017.3	Synthesis of Cellulose Derivatives Bearing Thiophene–Based π–Conjugated Pendants for Use as Chiral Fluorescent Sensors
2017.3	Colorimetric Chiral Recognition of Chiral Amines by Macromolecular Reaction with a Helical Poly(diphenylacetylene) Derivative
2017.3	Development of Amylose– and Cyclodextrin–Based Chiral Fluorescent Sensors Bearing Terthienyl Pendants
2017.3	Synthesis of Helical Polymers through Copolymerization of Isocyanide Monomers Derived from Amino Acids
2017.3	Synthesis of Cellulose Derivatives Bearing Pyrenyl Units and Their Fluorescent Properties
2016.3	Development of Chiral Stationary Phases Based on Helicity Control of Poly(biphenylylacetylene) Derivatives Bearing Various Polar Groups
2016.3	Synthesis of Helical Poly(diphenylacetylene) Derivatives Bearing Optically Active Pendants and Their Application as Chiral Stationary Phases for HPLC
2016.3	Chirality Sensing Using Helical Polyacetylene Derivatives Bearing Biphenyl Pendants
2016.3	Synthesis of Poly(diphenylacetylene) Derivatives with Macromolecular Helicity Memory and Their Application as Chiral Stationary Phases
2016.3	Synthesis of Helical Poly(diphenylacetylene) Derivatives Bearing Azacrown Ether Pendants and Their Chiroptical Properties
2016.3	Polymerization of Isocyanide Monomers Derived from Amino Acids and Chiroptical Properties of the Resulting Polymers
2015.3	Synthesis of Novel π–Conjugated Polymers Containing Glucose–Linked Biphenyl Units and Their Optical Properties
2015.3	Preparation of Immobilized Chiral Packing Materials Consisting of Poly(biphenylylacetylene) Derivatives and Their Resolution Abilities
2015.3	Synthesis of Optically Active Polymers Including Glucose and Conjugated Units in the Main Chain and Their Chiroptical Properties
2015.3	Synthesis and Conformational Control of Poly(biphenyleneethynylene)s Bearing Crown Ether Residues in the Main Chain
2015.3	Synthesis of Polyisocyanides with an Ordered Array of Oligothiophene Pendants and Their Chiroptical Properties
2015.3	Synthesis of Optically Active Poly(diphenylacetylene) Derivatives Prepared by Using Macromolecular Reaction and Their Application to Chiral Recognitions
2014.3	Synthesis of Polysaccharide Derivatives Bearing Oligothiophene Pendants and Their Application to Chiral Recognitions
2014.3	Synthesis of Polysaccharide Derivatives Capable of Macromolecular Reactions via Cross–coupling and Their Application to Chiral Auxiliaries
2014.3	Synthesis of Benzodithiophene–Based π–Conjugated Polymer Bearing Various Alkoxy Pendants and Their Optical Properties
2014.3	Synthesis of π–Conjugated Polymers Containing Phenanthrocarbazole Unit Aiming at Application to Polymer Solar Cells
2014.3	Synthesis of Optically Active Poly(phenylacetylene)s Bearing Binaphthocrown Ether Pendants and Their Chiral Discrimination Abilities
2014.3	Helicity Induction and Memory of the Macromolecular Helicity in Fluorescent Poly(diphenylacetylene) Derivatives
2013.3	Synthesis of Optically Active Poly(diphenylacetylene) Derivatives Bearing Amide Groups and Their Application
2013.3	Synthesis of Novel π–Conjugated Polymers Bearing Oligothiophene Pendants and Their Optical Properties
2013.3	Synthesis of Novel Thienopyrroledione–Based π–Conjugated Polymers and Their Optical Properties
2013.3	Synthesis of Poly(phenylacetylene)s Bearing Binaphthocrown Ether Pendants and Helicity Induction and Memory of the Macromolecular Helicity in Obtained Polymers
2013.3	Synthesis of Helical Polymer Brushes Consisting of Dynamic Helical Polymer Chains and Their Chiral Amplification Behavior

Recent Doctoral theses in these 3 years (+ more if appropriate)

year.month	Thesis title (including English translation of Japanese thesis title)
2016.3	Improvement and Development of Methods for Chemical Transformation of Organic Molecules with Characteristics of Molecular Oxygen
2015.3	Studies on Synthesis of Narrow Bandgap Polymers Aiming at Application to Polymer Solar Cells
2014.3	Studies on Synthesis and Chiral Amplification Phenomena of Polyacetylene Derivatives Bearing Dynamically Chiral Pendants

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