Division of Material Chemistry	Research field	Synthetic Organic Chemistry	Lab. ID MC12
Laboratory web site	http://kohka.ch.t.kanazawa-u.ac.jp/lab4/lab4.html		

Research subjects

Our major interests are synthetic organic chemistry, especially in the development of new synthetic organic reactions and materials using characteristics of heteroatoms and/or photochemistry. Our recent research topics are listed below.

1. Synthesis of novel heterocyclic compounds utilizing multiple bonds containing chalcogen elements
2. Construction of multi-functionalized molecules using transition-metal catalysts and heavy heteroatoms
3. Synthesis of asymmetric ligands having chalcogen elements
4. Development of highly efficient and selective new photochemical reactions
5. Development of functionalized fluorescent materials based on pyrene derivatives
6. Development of novel optical materials based on azaporphyrinoids
7. Synthesis of novel functional pi-electronic systems by the new organic reactions

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

In undergraduate students, you should train to master fundamental experimental technique, knowledge about safety, quantitative mentality, reading ability of literature, document retrieval, and English ability. Although we recommend you to study organic synthesis in undergraduate, you can join from the other fields with your high motivation on organic chemistry. In master and doctor courses, you follow each professor in our group and should attend group meetings and/or discussions. Meetings of reading textbooks and introduction of journal articles will be held once a week, respectively. Meetings of research seminar will be held 3-4 times in a year. After attendance at academic conferences, attendance report will be presented. Special lectures by the professors from the other institute will also be held randomly. Students attend domestic/international conferences to have a presentation of their research results. Finally, we will submit papers to international journals.

Daily life in the laboratory, etc.

Independent laboratory table and a desk are provided to each student. In the laboratory, students carry out not only organic synthetic experiments, but also analysis of physical properties, theoretical calculations, retrieve literature, making slides or papers for conferences, attending the classes, and discuss the results with professors and senior students. Since students should have many tasks, we recommend students strongly to work intensively from 9:00 am to late night. For the safety's reason, the experiments should be carried out without alone. In the seminars, students should have questions and comments for the other presentation.

Message or comments by the laboratory faculty staffs

It is interesting that research results include individual personality and originality. Experimental results are often anticipated, but unexpected results are sometimes obtained. When students meet such serendipity, it causes opportunity to be deeply fascinated by chemical research. To find serendipitous novel results, students need deep knowledge in the wide and various fields. We want to tell students an importance of a wide range of vision, a pleasure of research and creativity of solutions toward difficulties in future through the research activity. Please come to our laboratory if you are interested in organic chemistry, medicinal chemistry, and photochemistry. Many students will find work in future in chemical industry or pharmaceutical companies. Lab's recreational trip, beer party, softball/badminton day (including beer party), will be held at any time and you may attend them to spend comfortable days.

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

year.month	Thesis title (including English translation of Japanese thesis title)
2017.3	Synthesis of Chiral Bidentate Ligands Containing Phosphorus-Chalcogen Bond
2017.3	Synthesis of Selenosugar Derivatives via Cycloaddition Reaction of Selenoaldehydes
2017.3	Aromatic Rearrangement Reaction of Aryl Naphthylmethyl Ethers by Using Lewis Acids
2017.3	Structures and Fluorescence Properties of Stilbene Derivatives Containing Silyl Groups
2016.3	Effect of Substituents on Pyrene Ring upon Absorption and Fluorescence Properties of Silylethynylpyrenes
2016.3	Structures and Fluorescence Properties of (1,8)Pyrenophanes
2016.3	Inhibition of Fluorescence Quenching Process of Pyrene Core by Bulky Substituents
2016.3	Synthesis and Fluorescence Properties of (1,3)Pyrenophanes Containing Crown Ether Moieties
2016.3	Synthesis and Reaction of Pyridinium Ylides Substituted with a Selenocarbonyl Group
2015.3	One-Pot Synthesis of Selenium-Containing Heterocyclic Compounds by Selenation of Isocyanates Followed by Reaction with Propargyl Amines and Alcoholates
2015.3	Synthesis of Heterocyclic Compounds Having Vinyl Substituents Using Phenyl Homopropargyl Selenide

2015.3	Synthesis of Non-Natural Selenonucleosides Utilizing Cycloaddition of Selenoaldehydes and Stereospecific Ring Contraction
2015.3	Effects of Substituents on Silicon upon Absorption and Fluorescence Properties of Silylpyrenes
2015.3	Development of Metal Ion Responsible Fluorescence Sensors Based on Benzocrown Ether-Ethynylpyrene Linked Molecules
2015.3	Design and Synthesis of Bis(pyrenylethynyl) Compounds Which Exhibit Intense Intramolecular Excimer Emissions
2015.3	Absorption and Fluorescence Properties and Photoreactivity of 2-(Benzyloxymethyl)naphthalenes
2014.3	Synthesis of Selenosugar-Related Compounds Utilizing Cycloaddition Reaction of Selenoaldehydes with Danishefsky Diene
2014.3	Reaction of [4+2]Cycloadducts between Selenocarbonyl Compounds and Cyclopentadiene with Organolithium Reagents
2014.3	Synthesis and Conformations of 2,11-Dioxa[3.3]metacyclophanes
2014.3	Three-Components Coupling Reaction of Active Methylene Compounds, Dienes, and Electron-Deficient Alkenes via Photoinduced Electron Transfer
2014.3	Synthesis of Pyrenocrown Ethers and Their Recognition Ability for Metal Ions
2014.3	Development of Selective Modification of 4,5-Positions of Pyrene Using Photocycloadducts between Pyrene and Alkenes
2013.3	Synthesis of Chiral Bidentate Ligands Having Sulfur, Selenium, and Phosphorus by Using Prolinol as an Asymmetric Source
2013.3	[3+2]Cycloaddition of Selenoaldehydes with Nitrile Ylides
2013.3	Synthesis of Alkenes and Isocyanides Utilizing Selenation Reaction of Carbonyl Group Followed by Deselenation
2013.3	Synthesis and Reactions of Pyridinium *N*-Monosubstituted Selenocarbamoylmethylide Derivatives
2013.3	Photocycloaddition of Cyanonaphthalenes with Aromatic Alkynes
2013.3	Effects of Substituents on Silicon upon Absorption and Fluorescence Properties of Tetrakis(silylethynyl)pyrene Derivatives
Recent Doctoral theses in these 3 years (+ more if appropriate)	
year.month	Thesis title (including English translation of Japanese thesis title)
2013.3	Synthetic Transformations Based on Cooperativity of Phenylseleno Group and Transition-Metal Reagents
Laboratory mail address	Masahito Segi<segi@se.kanazawa-u.ac.jp>, Hajime Maeda<maeda-h@se.kanazawa-u.ac.jp>, Taniyuki Furuyama<tfuruyama@se.kanazawa-u.ac.jp>