

Division of Material Chemistry	Research field	Analytical Chemistry	Lab. ID
			MC06
Laboratory web site	https://analchem.w3.kanazawa-u.ac.jp/		
Research subjects			
The study covers spectroelectrochemical analysis of charge transfer reactions (ion/electron transfer, adsorption) and intermolecular association/self-assembly, analytical application of functional nanomaterials such as nanoparticles and supramolecules, and development of surface-sensitive spectroelectrochemical technique as well as chiroptical analysis based on surface plasmon. (a) Spectroelectrochemistry at liquid liquid interfaces Charge transfer and adsorption mechanisms including self-assembly and aggregation of various charged species at polarized liquid liquid interfaces are studied by novel modulation-spectroscopies. Our group focus on electrochemical control of liquid liquid distribution of ionic species through specific association with dendritic polymers for selective separation system and DDS application, mechanistic analysis of transmembrane mechanism of drugs and bioactive substances, stimuli-responsive interfacial activity/ionic partitioning, etc. (b) <i>In-situ</i> spectroscopic characterization of chemical reactions in solution Association and dissociation reaction of chemical species in solution, such as metal nanoparticle formation and interaction dynamics of drugs, are studied by in-situ spectroscopic techniques capable of monitoring molecular size and fluorescence lifetime. Novel fluorescent probes for real-time intracellular characterization such as microviscosity evaluation are also developed based on fluorescence lifetime measurements. (c) Elucidation of membrane reaction mechanisms of biomacromolecules Membrane reaction mechanisms of peptides and proteins are studied utilizing lipid monolayer-modified liquid liquid interfaces (biomimetic membrane surface) and liposome (artificial cell) to develop functional drug carriers.			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
The course of Material Analysis Chemistry II for physical analytical chemistry deals with solution chemistry of metal ions and complexes as well as thermodynamics of liquid-liquid distribution of metal complexes. The material analysis seminar for the purpose of the commentary of a recent article in English and the thorough discussion is performed a week. Each student makes the study program for the year to get the deep understanding of his/her research theme. A lab-meeting for the discussion of the progressive report of his/her research works is carried out every week. Furthermore, the lab-meeting for presenting his/her research findings is held in July and December.			
Daily life in the laboratory, etc.			
We have several lab-events in the year; for example, welcome party for new members and undergraduate students, cherry-blossom viewing (Hanami), inter-lab meetings with other universities, and laboratory parties in the middle and the end of the year. Each student is assigned a personal desk and experimental space.			
Message or comments by the laboratory faculty staffs			
In our research area, careful planning and arrangement for experiments are essential to obtain fruitful results. The research experience in our group will foster your ability to scientific thinking and practical skill required for professional analytical chemists. We highly encourage students to participate in academic conference for research presentation.			
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