

List of the laboratories available at the 4th year with the research project samples

Department of Applied Chemistry

Theoretical and Computational Chemistry, Radiation Chemistry (Okazaki Group)

- Molecular aspects of surface tension of spherical micelles based upon molecular dynamics calculations
- Lateral free energy profile of lipid molecules in the membranes studied by molecular dynamics calculations

Physical Chemistry of Polymers (Matsushita Group)

- Preparation and Morphology of Nanohybrids Composed of a Block Copolymer and Semiconductor Nanoparticles
- Effects of Composition Distribution on Microphase-Separated Structures from Triblock Terpolymers

Organic Material Chemistry (Shinokubo Group)

- Synthesis of the Smallest Antiaromatic Porphyrinoid
- Oxidation of Aminoanthracenes to Fused Anthracene Dimers

Organic Synthesis (Nishiyama Group)

- Asymmetric addition reaction of alkynes to unsaturated carbonyl compounds with chiral ruthenium complex
- Synthesis of Rh, Ir, Ru complexes with N-heterocarbene oxazoline ligands

Organic Chemistry of Macromolecules (Kamigaito Group)

- Living Cationic Polymerization via Reversible Addition-Fragmentation Chain Transfer Mechanism
- Controlled Radical Polymerization of Pinocarvone Derived from Naturally-Occurring α -Pinene

Organic Reactions (Ooi Group)

- Development of Asymmetric Henry Reaction Using Chiral Organic Base Catalysts
- Design of Chiral Azolium Salts as a New Phase-Transfer Catalyst

Inorganic Material Chemistry (Koumoto Group)

- Thermoelectric properties of Nb-doped SrTiO₃ thin films
- Misfit layer sulfides for thermoelectric materials

Applied Analytical Chemistry (Baba Group)

- Ultrafast Analysis of DNA and RNA by Nanodevices
- Quantum Dot Imaging of Stem Cell for Stem Cell Therapy

Function Design Chemistry (Seki Group)

- Photoalignment Control of Nanodomains in Liquid Crystalline Block Copolymer Thin Films
- Formation of Vertically Aligned Lamellae in Thin Films of Block Copolymer-Silica Hybrid Material

Organic Conversion Chemistry (Yashima Group)

- Synthesis and Application of Double-Stranded Helical Molecules
- Synthesis of Helical Polymers with Asymmetric Catalytic Activity

Chemistry of Inorganic Reactions (Satsuma Group)

- Selective hydrogenation of 2-hydroxymethyl-5-furfural to 2,5-bis(hydroxymethyl)furan over gold sub-nano clusters
- Improvement in catalytic activity of supported Pd catalysts for CO oxidation at low temperature

Crystalline State Chemistry (Ohtsuki Group)

- Protein adsorption on hydroxyapatite synthesized through hydrothermal processing
- Hydroxyapatite coating on magnetite particles through biomimetic processing

Material Design Chemistry (Torimoto Group)

- Plasmon-Enhanced Photocatalytic Activity of Cadmium Sulfide Nanoparticle Immobilized on Silica-Coated Gold Particles
- Preparation and Photoelectrochemical Properties of Densely Immobilized $\text{Cu}_2\text{ZnSnS}_4$ Nanoparticle Films

Division of Nano Materials Science Research-1 (Yogo Group)

- Synthesis and characterization of magnetic nanoparticle/organic hybrid materials
- Chemical processing and characterization of ferroelectric films

Division of Environmental Research (Kusunoki Group)

- Transmission electron microscope observation of formation process of epitaxial graphene on SiC.
- Formation of B-doped carbon nanotube films on SiC

Department of Biotechnology

Gene Engineering and Molecular Biology (Iijima Group)

- Production of recombinant biopharmaceuticals by transgenic chicken
- Analyses of novel anti-inflammatory responses of Siglecs

Bioprocess Engineering (Honda Group)

- Screening of functional short peptide by spot-synthesized peptide array
- Magnetic force based lab-on-a-chip for single cell analysis in a droplet

Environmental Biotechnology (Hori Group)

- Molecular mechanism of bacterial adhesion to solid surfaces
- Application of adhesive bacterionanofibers for microbial immobilization

Chemistry of Biologically Active Materials (Ishihara Group)

- Design of tailor-made conformationally flexible chiral supramolecular catalysts beyond enzymes
- Redox organocatalysis: hypervalent iodine-catalyzed oxidative coupling reactions

Biopolymer Chemistry (Asanuma Group)

- Photoregulation of DNA/RNA supramolecular functions by azobenzene-tethered oligonucleotides
- Development of super-sensitive fluorescent probes and their applications to m-RNA imaging in cell

Synchrotron Radiation Research Center (Watanabe Group)

- Structural biology of piezophiles using high-pressure protein crystallography and its application to the creation of pressure tolerant enzymes
- Structural study of macromolecular solutions using small-angle X-ray scattering and its application