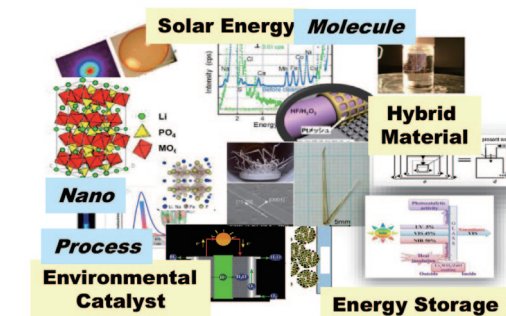


G2 Environment and Energy Materials, Devices and Process Research Project Group

Outline of G2 Research

The activity of the “Environment and Energy Materials, Devices and Process” group (G2) covers promotion of the studies to design environmental catalysts for industry, to realize ecological processing for a low carbon society, and to create new hybrid substances for environmental and energy issues. The studies will contribute to make new environmentally benign materials and devices as well as ubiquitous system integration.



Main members and their research subjects



<Group Leader>
Prof.
Kohtaro OSAKADA (LCLS)
■ Structure and Properties of Organometallic Middle-Molecule Compounds
Keywords: Silane, Organometallics, Oligomer, Optical properties



<Planning and Promotion Leader>
Assoc. Prof.
Keiji NAGAI (LCLS)
■ Organophotocatalyst composed of p-n junction
Keywords: Photocatalyst, Photo-energy conversion, Water purification



<Vice-Leader>
Prof.
Akira ISHIBASHI (RIES)
■ High efficiency solar cells and clean systems
Keywords: Solar cell, High efficiency, Clean system



Assoc. Prof.
Kosei UENO (RIES)
■ Control of chemical reactions utilizing strong coupling in the infrared region
Keywords: Metallic nanostructures, Strong coupling, Molecular vibrational mode



Prof.
Junji NISHII (RIES)
■ Subwavelength optical materials and devices
Keywords: Sub-wavelength Optics, Optical device, Nanostructure



Assoc. Prof.
Shin-ichiro NORO (RIES)
■ Synthesis and high functionalization of porous metal complexes
Keywords: Porous metal complexes, Porous properties, Gas separation/purification, Composites



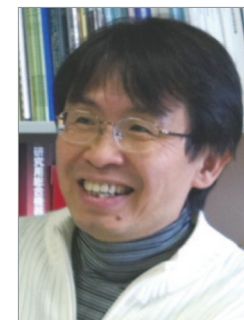
Prof.
Hiroaki MISAWA (RIES)
■Development of artificial photosynthesis systems using plasmonic antennae
Keywords: Localized plasmon, Nanomaterials, Plasmonic chemistry



<Vice-Leader>
Prof.
Hiroyuki FUKUYAMA (IMRAM)
■High-temperature physical chemistry of materials
Keywords: Chemical thermodynamics, Thermophysical properties of high-temperature melts, Crystal growth



Prof.
Takashi KYOTANI (IMRAM)
■Synthesis and design of novel nanocarbon materials and their nanohybrids
Keywords: Energy storage media, Bio-application of nanocarbons, Graphene



Prof.
An-Pang TSAI (IMRAM)
■Studies on formation of quasicrystal and catalysts in terms of metallurgy
Keywords: Quasicrystal, Intermetallic compound, Electron compound, Catalysts



Prof.
Tadafumi ADSCHIRI (IMRAM)
■Supercritical hydrothermal synthesis of organic-inorganic hybrid nanoparticles
Keywords: Supercritical fluid, Organic inorganic hybrid materials, Nanoparticles



Prof.
Koji AMEZAWA (IMRAM)
■Development of environmentally-friendly energy conversion devices based on solid state ionics
Keywords: Solid state ionics, Energy conversion, Fuel cells Batteries



Prof.
Nobuaki SATO (IMRAM)
■Development of dry and wet processes for rare metal resources containing radioactive materials
Keywords: Rare metal resources, Radioactive materials, Material processing



Prof.
Etsuro SHIBATA (IMRAM)
■Establishment of metal resource circulation engineering
Keywords: Non-ferrous metallurgy, Recycling, Waste treatment



Prof.
Shu YIN (IMRAM)
■Creation of multi-functional environmental responsive nanomaterials
Keywords: Multi-functional, Environmental response, Eco-materials



Prof.
Takahisa OMATA (IMRAM)
■Development of inorganic energy conversion materials using ion-exchange
Keywords: Material Design, Topotactic Ion-Exchange, Proton Conductor, Solar Cell Absorber



Prof.
Hiroyuki SHIBATA (IMRAM)
■Thermal properties of molten silicates and solution growth of SiC
Keywords: Thermal property, Molten silicates, Silicon carbide, Solution growth



Prof.
Shigeru SUZUKI (IMRAM)
■Characterization and control of functional base-metal oxides and alloys
Keywords: Functional materials, Iron based oxides, Iron based alloys



Prof.
Masato KAKIHANA (IMRAM)
■Construction of high-performance photoceramics
Keywords: Photocatalyst, Phosphor, Exploration of new materials



Prof.
Junya KANO (IMRAM)
■Novel powder processing for renewable energy and its efficiency improvement
Keywords: Biomass, Mechanochemical processing, DEM simulation



Prof.
Masami TERAUCHI (IMRAM)
■Electron crystallography & spectroscopy based on electron microscopy
Keywords: Convergent-beam electron diffraction, Electron energy-loss spectroscopy, Soft-X-ray emission spectroscopy



Prof.
Hiroshi NOGAMI (IMRAM)
■Development of novel material processing through kinetic based reaction analysis
Keywords: Process analysis, Thermal fluid analysis, Reaction kinetics



Prof.
Junichi KAWAMURA (IMRAM)
■Measurement of ion dynamics by NMR and laser spectroscopy for the application to energy storage materials
Keywords: Lithium ion battery, NMR imaging, In-situ spectroscopy, Solid state ionics



Prof.
Shin-ya KITAMURA (IMRAM)
■Composition control of nano-size particles in environmental friendly steel
Keywords: Deoxidation product, Chemical metallurgy, Steelmaking



Prof.
Itaru HONMA (IMRAM)
■Advanced nanotechnologies for energy conversion devices
Keywords: Lithium ion batteries, Supercapacitor, Solar cells/Fuel cells, Nanomaterials/Nanoprocessing



Prof.
Atsushi MURAMATSU (IMRAM)
■Synthesis processing of nanoparticulate functional materials in liquid-phase
Keywords: Nanoparticles, Synthesis process, Hybrid materials



Assoc. Prof.
Koyo NORINAGA (IMCE)
■Reaction engineering for carbon resource conversion and materials synthesis
Keywords: Detailed chemical kinetics, Coal and biomass, Composite materials



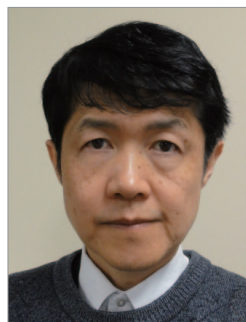
Prof.
Jun-ichiro HAYASHI (IMCE)
■Energy/material-efficient conversion of fossils and biomass to fuels/chemicals/materials
Keywords: Reactor/process design, Chemical kinetics, Thermal/catalytic reactions



Assoc. Prof.
Jin MIYAWAKI (IMCE)
■Design and development of high-performance porous adsorbent materials
Keywords: Porous materials, Adsorption, Heat pump



Prof.
Seong-Ho YOON (IMCE)
■Development of N-doped nano-graphene and its application to nano-fluid
Keywords: Nanofluid, N-doped nano-graphenes, Carbon nanofiber



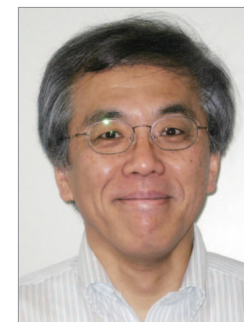
Prof.
Hisanori YAMANE (IMRAM)
■ Synthesis and crystal structure analysis of new ceramic materials
Keywords: Multinary nitrides and oxides, X-ray diffraction, Flux growth



<Vice-Leader>
Prof.
Takeo YAMAGUCHI (LCLS)
■ Design and development for fuel cell materials and devices
Keywords: Electrolyte membrane, Catalysts, Polymer electrolyte fuel cell, Solid alkaline fuel cell



Prof.
Tohru SEKINO (ISIR)
■ Multifunctional materials via low-dimensional nano-macro structure controls
Keywords: Nanocomposite, Low-d nanomaterials, Functional Structure Ceramics



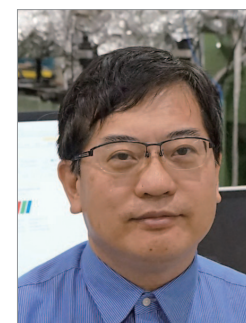
Prof.
Seiji TAKEDA (ISIR)
■ Operando study of nanoparticulate catalysts
Keywords: CO oxidation, Environmental transmission electron microscopy, Gold



Prof.
Munetaka AKITA (LCLS)
■ Visible light-driven organic synthesis by photoredox catalysis
Keywords: Visible light, Photoredox catalysis, Organic synthesis



Assoc. Prof.
Take-aki KOIZUMI (LCLS)
■ Development of transition metal complexes bearing functional ligands
Keywords: Transition metal complexes, Low Environmental load type reaction, Dynamic behavior



Assoc. Prof.
Shin-ichiro TANAKA (ISIR)
■ Electron dynamics in the solid and on the solid surface by means of the electron spectroscopies
Keywords: Electron dynamics in the condensed matter, High-resolution angle-resolved photoelectron spectroscopy, Time-resolved two-photon photoelectron spectroscopy



Assoc. Prof.
Yoshihide HONDA (ISIR)
■ Development of diagnostic methods for materials based on radiation-related technology
Keywords: Polymer, Clay, Positron, Electron beam



Assoc. Prof.
Daisuke TAKEUCHI (LCLS)
■ Synthesis of Polyolefins with Polar Functional Groups
Keywords: Polyolefins, Late Transition Metal Catalysts, Controlled Polymerization



Lecturer
Takanori TAMAKI (LCLS)
■ Development of High-Performance Enzymatic Biofuel Cells
Keywords: Bioelectrochemistry, Enzyme, Systematic material design



Prof.
Tetsuro MAJIMA (ISIR)
■ Beam-induced Chemistry
Keywords: Photochemistry of supra-molecules, Metal nanoparticles and metal, oxides photocatalysts, Single molecule chemistry, Radiation chemistry



<Vice-Leader>
Prof.
Shigeto OKADA (IMCE)
■ Development of post lithium-ion batteries
Keywords: Sodium-ion battery, Cathode active material, Intercalation, Conversion reaction



Assoc. Prof.
Junko NOMURA KONDO (LCLS)
■ Preparation of mesoporous metal oxides and IR characterization of solid catalyst surfaces
Keywords: Porous material, Metal oxide, IR, Catalyst



Prof.
Kimihisa YAMAMOTO (LCLS)
■ Development of Subnano Hybrid Materials
Keywords: Subnano Particles, Dendrimer, Hybrid Materials



Assoc. Prof.
Masato ITO (IMCE)
■ Molecular design for energy saving
Keywords: Electrode active material, Gas barrier material, Molecular catalyst



Assoc. Prof.
Koichi OKAMOTO (IMCE)
■ Applications of plasmonics for green nanotechnologies
Keywords: Plasmonics, LED, Solar cell



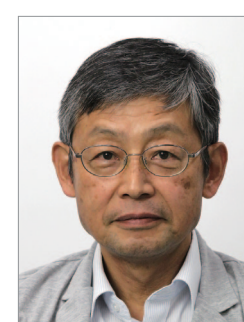
<Vice-Leader>
Prof.
Hikaru KOBAYASHI (ISIR)
■ Highly efficient Si solar cells, and fabrication and application of Si nanopowder
Keywords: Surface control, Swarf, Hydrogen generation



Prof.
Katsuaki SUGANUMA (ISIR)
■ Wearable stretchable and WBG power interconnections
Keywords: Printed electronics, Stretchable wiring, WBG Power interconnection



Assoc. Prof.
Ken KOJIO (IMCE)
■ Development of solid polymer electrolytes based on oligocarbonate for lithium ion battery
Keywords: Polymer electrolyte, Oligocarbonate, Lithium ion battery



Assoc. Prof.
Yoshiaki TAKAHASHI (IMCE)
■ Hierarchical structure and physical properties of polymers
Keywords: Natural polymers, Ionic liquids, Rheology