



TITLE:

Activities of International Joint Usage/Research Center

AUTHOR(S):

CITATION:

Activities of International Joint Usage/Research Center. ICR annual report 2020, 27: 67-74

ISSUE DATE:

2020

URL:

<http://hdl.handle.net/2433/262862>

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ACTIVITIES OF
INTERNATIONAL **J**OINT
USAGE/**R**ESEARCH
CENTER



iJURC Cooperative Research Subjects 2020

(1 April 2020 ~ 31 March 2021)

STARTING-UP SUBJECTS (IN SPECIFIC FIELDS CHOSEN BY iJURC)

Fabrication and Design of Chiral Plasmonic Nanostructures Based on Chemical Methods
NAKAGAWA, Makoto, Osaka Research Institute of Industrial Science and Technology
Host in iJURC KURATA, Hiroki

Study of Formation of Fine Periodic Structures Induced by Two Color Optical Pulses
NAGASHIMA, Takeshi, Faculty of Science and Engineering, Setsunan University
Host in iJURC HASHIDA, Masaki

Development of New Nano-structure Target for ISOL
OHNISHI, Tetsuya, SCRIT Team, Instrumentation Development Group, Nishina Center for Accelerator-Based Science, RIKEN
Host in iJURC WAKASUGI, Masanori

Study of Strange Structures of Short-lived Unstable Nuclei by Electron Scattering
SUDA, Toshimi, Electron Photon Science Laboratory, Tohoku University
Host in iJURC WAKASUGI, Masanori

Gas Sensing Properties Research of Transition-metal Oxides
GUO, Haichuan, Ningbo Institute of Industrial Technology (CNITECH) of the Chinese Academy of Sciences
Host in iJURC SHIMAKAWA, Yuichi I

Separation and Evaluation of Thiolate Protected Metal Clusters with Atomic Precision by Using LC/MS
NEGISHI, Yuichi, Department of Applied Chemistry, Tokyo University of Science
Host in iJURC TAKAYA, Hikaru I

Iron-catalyzed C-H Borylation
HAJRA, Alakananda, Department of Chemistry, Visva-Bharati University
Host in iJURC NAKAMURA, Masaharu I

Electrochemically Engineered Peptide Based Organic-Inorganic Nanohybrids for Electrocatalytic Conversion of Biomass into Value Added Chemicals
DAS, Apurba K., Department of Chemistry, Indian Institute of Technology Indore
Host in iJURC NAKAMURA, Masaharu I

Iron-catalyzed Enantioselective Carbometalation and Ring-opening Reactions of Oxabicycloalkenes and other Related Substrates and Mechanistic Consideration
ADAK, Laksmikanta, Department of Chemistry, Indian Institute of Engineering Science and Technology
Host in iJURC NAKAMURA, Masaharu I

Functionalization of Urushiol Coating Film Using Magnetic Particles
TACHIBANA, Yoichi, Kyoto Municipal Institute of Industrial Technology and Culture
Host in iJURC NAKAMURA, Masaharu

A Study on Statistical Machine Learning for Efficient Graph Structured Data Analysis
KARASUYAMA, Masayuki, Department of Computer Science, Nagoya Institute of Technology
Host in iJURC MAMITSUKA, Hiroshi I

Revealing Associations Between Giant Viruses and Eukaryotes in the Global Ocean Through Community Networks Inference and Mining
CHAFFRON, Samuel, Laboratoire des Sciences du Numérique de Nantes (LS2N), Centre National de la Recherche Scientifique (CNRS)
Host in iJURC ENDO, Hisashi I

Unveiling the Genomic Contents of Ecologically Important Marine Giant Viruses
DELMONT, Tom, Genoscope, Centre National de la Recherche Scientifique (CNRS)
Host in iJURC OGATA, Hiroyuki I

Development of Predictive Methods for Marine Microbial Communities Based on Remote Sensing Data
TOMII, Kentaro, Artificial Intelligence Research Center, The National Institute of Advanced Industrial Science and Technology
Host in iJURC OGATA, Hiroyuki

Control and Analysis of Complex Networks via Probabilistic Minimum Dominating Sets
NACHER, Jose C., Department of Information Science, Faculty of Science, Toho University
Host in iJURC AKUTSU, Tatsuya

Genomics and Transcriptomics of Giant Viruses
TAKEMURA, Masaharu, Faculty of Science, Tokyo University of Science
Host in iJURC OGATA, Hiroyuki

Whole Genome Analyses of Marine Bacterivorous Heterotrophic Nanoflagellates
KATAOKA, Takafumi, Faculty of Marine Science and Technology, Fukui Prefectural University
Host in iJURC ENDO, Hisashi

Comparative Genome Analysis of Parmales and Diatoms: Looking for the Ancestral Genomic Feature
SATO, Shinya, Faculty of Marine Science and Technology, Fukui Prefectural University
Host in iJURC OGATA, Hiroyuki

Exploration of Cycloaddition Properties of Guanidine Functionalized Anthracenes
DAVOR, Margetic, Division of Organic Chemistry and Biochemistry, Rudjer Boskovic Institute
Host in iJURC MURATA, Yasujiro I

Preparation of Dynamic Induced-helical Conformation in Block Copolymer and Investigation of Its Dominant Factor
HIRAI, Tomoyasu, Osaka Institute of Technology
Host in iJURC TAKENAKA, Mikihiro

I: International Joint Research

F: Female PI

Development of Kinetic Resolution for N-N Axial Chirality by Organocatalyst
YOSHIDA, Keisuke, Faculty of Pharmacy, Meijo University
Host in iJURC KAWABATA, Takeo

Molecular Understanding on the Structures and Dynamics of Ionic End-aggregation Polymers
VAO-SOONGNERN, Visit, School of Chemistry, Suranaree University of Technology
Host in iJURC WATANABE, Hiroshi I

Dynamics of Shear-induced Concentration Fluctuation in Polymer Solutions
ENDOH, Maya K., Department of Material Science and Chemical Engineering, Stony Brook University
Host in iJURC TAKENAKA, Mikihito I F

Identification of an Active Gibberellin Compound in the Basal Land Plant *Marchantia polymorpha*
KOHCHI, Takayuki, Graduate School of Biostudies, Kyoto University
Host in iJURC YAMAGUCHI, Shinjiro

Dynamic Viscoelasticity and Tensile Properties of Thermoplastic Elastomers
NORO, Atsushi, Department of Applied Chemistry, Nagoya University
Host in iJURC WATANABE, Hiroshi

Construction of Theoretical Guidelines for Designing Plasmonic Nanoalloys
IIDA, Kenji, Institute for Catalysis, Hokkaido University
Host in iJURC TERANISHI, Toshiharu

Study on Transportation of Metal Ions Through a Polymer Membrane Containing Ionic Liquid
MUKAI, Hiroshi, Faculty of Education, Kyoto University of Education
Host in iJURC SOHRIN, Yoshiki

EXPANDING SUBJECTS (IN SPECIFIC FIELDS CHOSEN BY iJURC)

Unveil the Effect of Vibrational Strong Coupling on Molecular Reactivity
HIRAI, Kenji, Research Institute for Electronic Science, Hokkaido University
Host in iJURC KANEMITSU, Yoshihiko

X-Ray Structural Studies on Ligand Complexes of Maleylacetate Reductase
OIKAWA, Tadao, Faculty of Chemistry, Materials and Bioengineering, Kansai University
Host in iJURC FUJII, Tomomi

New Functionalities on Metal Surface with Controlling Laser Plasma Density
KUSABA, Mitsuhiro, Department of Electronics, Information and Communication Engineering, Faculty of Engineering, Osaka Sangyo University
Host in iJURC HASHIDA, Masaki

Small Molecule Activation Using Anionic Crypto-FLPs
STREUBEL, Rainer, Institute for Inorganic Chemistry, University of Bonn
Host in iJURC TOKITOH, Norihiro I

Design and Tailoring Advanced Functional Materials: Symmetry Operation and High Pressure Synthesis
CHEN, Wei-Tin, Center for Condensed Matter Sciences, National Taiwan University
Host in iJURC SHIMAKAWA, Yuichi I

Development of Unsymmetrical π -Electron Systems of Heavier Main Group Elements and Elucidation of Their Property
IWAMOTO, Takeaki, Department of Chemistry, Tohoku University
Host in iJURC TOKITOH, Norihiro I

Optical Control of High-order Harmonic Generation from Solids
SATO, Shunsuke A., Max-Planck Institute for Structure and Dynamics of Matter/Center for Computational Sciences, University of Tsukuba
Host in iJURC KANEMITSU, Yoshihiko I

Study on the Stability of Novel Ternary Nanoparticles by Doping 3rd Elements
TATETSU, Yasutomi, Liberal Arts Education Center, Meio University
Host in iJURC TERANISHI, Toshiharu

Development of an Ultrashort Mid-infrared Light Source for Highly Efficient Extreme Nonlinear Optics in Solids
ISHII, Nobuhisa, National Institutes for Quantum and Radiological Science and Technology
Host in iJURC KANEMITSU, Yoshihiko

Magnon-phonon Excitation in Multiferroic Materials by Intense Terahertz Pulses
SATO, Takuya, Department of Physics, Tokyo Institute of Technology
Host in iJURC HIRORI, Hideki

Comprehensive Understanding and Modeling of the Termination Mechanism in Radical Polymerization
NAKAMURA, Yasuyuki, Research and Services Division of Materials Data and Integrated System, National Institute for Materials Science
Host in iJURC YAMAGO, Shigeru

Development of Dinuclear Nickel Complexes Based on a Monoanionic Tridentate Pincer-type Ligand
YAMAGUCHI, Yoshitaka, Faculty of Engineering, Yokohama National University
Host in iJURC NAKAMURA, Masaharu

Creation of Effective Oxidation Scavenger for Efficient Perovskite-based Solar Cells
SASAMORI, Takahiro, Division of Chemistry, Faculty of Pure and Applied Sciences, University of Tsukuba
Host in iJURC WAKAMIYA, Atsushi

Integrating Omics Data and Module-based Network with Deep Learning to Develop Cancer Type Predictive Models
YANG, Jinn-Moon, Department of Biological Science and Technology, National Chiao Tung University /Institute of Bioinformatics & Systems Biology
Host in iJURC AKUTSU, Tatsuya I

Next-generation Bioinformatics Approaches for the Accurate Identification of Protease-specific Substrate Cleavage Sites
SONG, Jiangning, Biomedicine Discovery Institute, Monash University
Host in iJURC AKUTSU, Tatsuya I

Statistical Machine Learning Methods and Applications in Molecular Network Analysis

KAYANO, Mitsunori, Research Center for Global Agromedicine, Obihiro University of Agriculture and Veterinary Medicine
Host in iJURC MAMITSUKA, Hiroshi

Light Emission from Halide Perovskites and Related Materials
LIU, Ru-Shi, Department of Chemistry, National Taiwan University

Host in iJURC KANEMITSU, Yoshihiko I

Development of New Blue TADF Emitters with Horizontal Molecular Orientations

ZYSMAN-COLMAN, Eli, EaStCHEM School of Chemistry, Organic Semiconductor Centre, University of St Andrews

Host in iJURC KAJI, Hironori I

Coupling of Nanographenes and Curved π -Systems and Elucidation of Their Electronic and Optical Interactions

NARITA, Akimitsu, Organic and Carbon Nanomaterials Unit, Okinawa Institute of Science and Technology Graduate University (OIST)

Host in iJURC HIROSE, Takashi I

Development of Hole Transport Materials for Tin-perovskite and Device Characterization

SAEKI, Akinori, Department of Applied Chemistry, Graduate School of Engineering, Osaka University

Host in iJURC WAKAMIYA, Atsushi I

Development of π -Conjugated Nickel Complexes for High Performance n-Type Thermoelectric Materials

MURATA, Michihisa, Department of Applied Chemistry, Faculty of Engineering, Osaka Institute of Technology

Host in iJURC MURATA, Yasujiro

Synthesis of Novel Organic Functional Dye Bearing Heteroazulene Unit

KUROTOBI, Kei, Department of Liberal Arts (Natural Science and Mathematics), National Institute of Technology, Kurume College

Host in iJURC MURATA, Yasujiro

A Study of Reactive Intermediates in Macrocyclic Systems

ABE, Manabu, Department of Chemistry, Graduate School of Science, Hiroshima University

Host in iJURC YAMAGO, Shigeru

Observation of Orbital Hall Effect in Ferromagnet/Nonmagnet Bilayers

KIM, Sanghoon, Department of Physics, University of Ulsan

Host in iJURC ONO, Teruo I

High Frequency Response of Polymeric Liquids: Rheology and Dielectric Relaxation

SUKUMARAN, Sathish K., Graduate School of Organic Materials Science, Yamagata University

Host in iJURC WATANABE, Hiroshi I

Trace Metal Elemental and Isotopic Composition in the North Pacific Ocean: Sources and Internal Cycling

HO, Tung-Yuan, Academia Sinica, Research Center for Environmental Changes

Host in iJURC SOHRIN, Yoshiki I

Revealing Exciton Quenching Mechanisms in Thermally Activated Delayed Fluorescent Devices

SAMUEL, Ifor D. W., Organic Semiconductor Centre, SUPA, School of Physics and Astronomy, University of St Andrews

Host in iJURC KAJI, Hironori I

Fabrication of Low Bandgap Semiconductor Films and Their Light Induced Interfacial Charge Transfer and Charge Transport Dynamics

TACHIBANA, Yasuhiro, School of Engineering, RMIT University

Host in iJURC TERANISHI, Toshiharu I

Visualization of Sulfur Distribution in Polymer Thin Films Using GISAXS-CT

FUJIWARA, Akihiko, Kwansai Gakuin University

Host in iJURC TAKENAKA, Mikihito

Origin Analysis of Atmospheric Aerosol of Mountainous Areas by Trace Metal Analysis

NAKAGUCHI, Yuzuru, Faculty of Science and Engineering, Kindai University

Host in iJURC SOHRIN, Yoshiki

Analysis of Membrane Structure and Properties of Partially Fluorinated Amphiphilic Molecules

SONOYAMA, Masashi, Faculty of Science and Technology, Gunma University

Host in iJURC HASEGAWA, Takeshi

Exploration of Hierarchical Dynamics of Amorphous Polymers by Broadband Dielectric Spectroscopy

URAKAWA, Osamu, Department of Macromolecular Science, Osaka University

Host in iJURC MATSUMIYA, Yumi

STARTING-UP SUBJECTS (ON-DEMAND FROM RELATED COMMUNITIES)

Dielectric Relaxation of Type-A Rouse Chain under End-adsorption/desorption Equilibrium: Effect of Motional Coupling

KWON, Youngdon, School of Chemical Engineering, Sungkyunkwan University

Host in iJURC MATSUMIYA, Yumi I

Role of PX-PH-type Phospholipase Ds in Plant Intracellular Membrane Traffic

OHASHI, Yohei, MRC Laboratory of Molecular Biology

Host in iJURC AOYAMA, Takashi I

Application of Artificial Viral Capsid to Intracellular Delivery

MATSUURA, Kazunori, Department of Chemistry and Biotechnology, Tottori University

Host in iJURC FUTAKI, Shiroh

Novel Strategy for Intracellular Delivery of Nanomedicines

PUJALS, Silvia, Nanoscopy for Nanomedicine Group, Institute for Bioengineering of Catalonia (IBEC)

Host in iJURC FUTAKI, Shiroh I F

Construction of Heterologous Protein Secretion System at Low Temperatures by Using Cold-adapted Microorganisms

DAI, Xianzhu, College of Resources and Environment, Southwest University

Host in iJURC KURIHARA, Tatsuo I F

Formation of Supramolecular Complexes Through a Host-guest Interaction Between Cycloparaphenylene and Azacorannulenes

ITO, Shingo, Division of Chemistry and Biological Chemistry, School of Physical and Mathematical Sciences, Nanyang Technological University (NTU)

Host in iJURC YAMAGO, Shigeru I

Interdisciplinary Approach to Nanostructured Materials for Applications

BUCHER, Jean-Pierre, Institut de Physique et Chimie des Matériaux (IPCMS), Université de Strasbourg

Host in iJURC TERANISHI, Toshiharu I

Relationship between Chain Orientation, Amount of Defects, and Toughness of Glassy Polystyrene Materials

CHEN, Quan, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences (CAS)

Host in iJURC MATSUMIYA, Yumi I

Fabrication of Thin Films and Structural Characterization of Self-Assembled Lanthanoid Complexes

MIEDA, Eiko, Graduate School of Science Molecular Materials Science Course, Osaka City University

Host in iJURC HASEGAWA, Takeshi F

Study on the Regulatory Network of Plant Epidermal Cell Differentiation

TOMINAGA, Rumi, Graduate School of Integrated Sciences for Life, Hiroshima University

Host in iJURC AOYAMA, Takashi F

Immune-stimulatory Nano-assemblies

YAMASAKI, Sho, Research Institute for Microbial Disease, Osaka University

Host in iJURC UESUGI, Motonari

Analysis of Phase Equilibrium and Molecular Dynamics in Mixture of Nematic Liquid Crystal and Solvent

SHIMADA, Ryoko, Department of Mathematical and Physical Sciences, Japan Women's University

Host in iJURC WATANABE, Hiroshi F

Functional Analysis of the CYP711A Family in Strigolactone Biosynthesis of Rice

IZAWA, Takeshi, Graduate School of Agricultural and Life Sciences, The University of Tokyo

Host in iJURC MASHIGUCHI, Kiyoshi

Self-assembling Molecules for Improvement of Cardiomyocyte Engraftment

SHIBA, Yuji, School of Medicine, Shinshu University

Host in iJURC UESUGI, Motonari

Giant Exchange Reaction from H to D Terminating on Nanocrystalline Silicon Surface and Their Use

MATSUMOTO, Takahiro, Graduate School of Design and Architecture Industrial Innovation Design, Nagoya City University

Host in iJURC KANEMITSU, Yoshihiko

Solid Phase Extraction of Metal Ion by Solvent Impregnated Resin Using Surfactant

KURAHASHI, Kensuke, Environmental and Materials Chemistry Course, Osaka Prefecture University College of Technology

Host in iJURC SOHRIN, Yoshiki

Studies on Aromaticity of Cyclic Paraphenylenes with Möbius Topology

FUJITSUKA, Mamoru, The Institute of Scientific and Industrial Research, Osaka University

Host in iJURC YAMAGO, Shigeru

Study on Electronic and Magnetic Behavior of Perpendicularly Magnetized Cobalt Ferrite Films

TANAKA, Masaaki, Department of Physical Science and Engineering, Nagoya Institute of Technology

Host in iJURC ONO, Teruo

Study of the Generation and Sustainment of High Energy Density Plasmas due to the Interaction between High Power Laser and Structured Medium

KISHIMOTO, Yasuaki, Graduate School of Energy Science, Kyoto University

Host in iJURC INOUE, Shunsuke

Functional Analysis of Membrane Lipids on Environmental Stress Tolerance in Acetic Acid Bacteria

TOYOTAKE, Yosuke, Department of Biotechnology, College of Life Sciences, Ritsumeikan University

Host in iJURC OGAWA, Takuya

Study on Water Freezing with Cellulose and Their Anti-icing Control by Surface Modification

SAKAKIBARA, Keita, National Institute of Advanced Industrial Science and Technology

Host in iJURC TSUJII, Yoshinobu

Asymmetric Umpolung C–C Bond Formation via Expression of Dynamic Chirality

MORIYAMA, Katsuhiko, Graduate School of Science, Chiba University

Host in iJURC KAWABATA, Takeo

Studies on Enantioselective Total Syntheses of Marine Natural Product Bohemamines and Their Derivatives

YOSHIMURA, Tomoyuki, Division of Pharmaceutical Sciences, Graduate School of Medical Science, Kanazawa University

Host in iJURC KAWABATA, Takeo

Development of Efficient Conversion Method of Woody Biomass, Renewable Biological Resources, to Advanced Chemical Materials

HATANO, Osamu, Nara Medical University

Host in iJURC NAKAMURA, Masaharu

EXPANDING SUBJECTS (ON-DEMAND FROM RELATED COMMUNITIES)

Molecular Mechanisms for the Inactivation of a Growth Hormone in Rice

HE, Zuhua, Institute of Plant Physiology and Ecology, CAS Center for Excellence in Molecular Plant Sciences, Chinese Academy of Sciences

Host in iJURC YAMAGUCHI, Shinjiro I

Well-defined AIE-based Polymer Brush for the Application of the Electrochemical Luminescence Biosensors

MA, Ying, Chemistry and Chemical Engineering, South China University of Technology

Host in iJURC OHNO, Kohji I

Role of Phosphoinositide Signaling in Pollen Development

ZHONG, Sheng, School of Life Sciences, Peking University

Host in iJURC AOYAMA, Takashi I F

Proteomic Approach to Discovering Specific Inhibitors for Bile-acid Interacting Enzymes

LEI, Xiaoguang, College of Chemistry and Molecular Engineering, Peking University

Host in iJURC UESUGI, Motonari I

Transfer of Redox Sensitive Elements (Fe, Mn, Zn) Across the Sediment-water Interface in a Hypoxia Area Near the East Chia Sea

CAI, Pinghe, Department of Marine Chemistry and Geochemistry, Xiamen University

Host in iJURC SOHRIN, Yoshiki I

- Structural and Functional Analysis of Curvature-inducing Peptides and Application
ULRICH, Anne S., Institute of Organic Chemistry (IOC) and Institute of Biological Interfaces (IBG-2), Karlsruhe Institute of Technology (KIT)
Host in iJURC FUTAKI, Shiroh I F
- Site-selective Protein Acetylation by a Small Molecule
ZHOU, Lu, School of Pharmacy, Fudan University
Host in iJURC UESUGI, Motonari I
- Modulation of Ferrimagnetic Spin Waves by Electric Field
KIM, Kab-Jin, Department of Physics, Korea Advanced Institute of Science and Technology
Host in iJURC ONO, Teruo I
- Development of Highly Efficient and Stable Blue Organic Light Emitting Diodes Using Thermally Activated Delayed Fluorescent Materials with Ultrafast Reverse Intersystem Crossing
DUAN, Lian, Department of Chemistry, Tsinghua University
Host in iJURC KAJI, Hironori I
- Fabrication of Nanotopographical Polymer Surfaces for Bactericidal Properties-II
ENDO, Maya K., Department of Material Science and Chemical Engineering, Stony Brook University
Host in iJURC TAKENAKA, Mikihito I F
- Synthesis of Polyether Nanocomposite Solid Polymer Electrolytes for Lithium Ion Batteries
FERRIER, Robert C., Chemical Engineering and Materials Science, Michigan State University
Host in iJURC OHNO, Kohji I
- Structural and Functional Analysis of the Surface Glycolipids of Outer Membrane Vesicles Released by Bacteria
CORSARO, Maria Michela, Department of Chemical Sciences, University of Naples Federico II
Host in iJURC KURIHARA, Tatsuo I F
- Molecular Mechanisms Governing Gene Expression Regulation in Plant Plasticity
RUBIO, Vicente, Plant Molecular Genetics Department, National Center of Biotechnology (CNB-CSIC)
Host in iJURC TSUGE, Tomohiko I
- Research of Multi-qubit Diamond Quantum Processors
DOHERTY, Marcus W., Research School of Physics and Engineering, Australian National University
Host in iJURC MIZUOCHI, Norikazu I
- Research Toward Stable NV Centers at Shallow Region in Diamond
BALASUBRAMANIAN, Gopalakrishnan, Max-Planck Institute for Biophysical Chemistry
Host in iJURC MIZUOCHI, Norikazu I
- Advanced Iodine – Mediated Stereoselective Flow Electrochemistry
WIRTH, Thomas, School of Chemistry, Cardiff University
Host in iJURC KAWABATA, Takeo I
- Cation- π Interaction in Enolate Chemistry
CLAYDEN, Jonathan, School of Chemistry, University of Bristol
Host in iJURC KAWABATA, Takeo I
- Search for Four-wave-mixing in the Vacuum–Unveiling Dark Components in the Universe –
HOMMA, Kensuke, Physics, Hiroshima University
Host in iJURC INOUE, Shunsuke I
- Fine Synthesis of Polymer Brush on Ferromagnetic Nano-platelet for Magnetophotonic LC
UCHIDA, Yoshiaki, Graduate School of Engineering Science, Osaka University
Host in iJURC OHNO, Kohji
- Functional Analysis of Non-canonical Strigolactones as Plant Hormones and Root-derived Signals
SETO, Yoshiya, School of Agriculture, Meiji University
Host in iJURC YAMAGUCHI, Shinjiro
- Analysis of the Physiological Functions of Extracellular Vesicles Produced by Intestinal Bacteria and Fermented Food-derived Bacteria and Their Application
KURATA, Atsushi, Faculty of Agriculture, Kindai University
Host in iJURC KURIHARA, Tatsuo
- Observation of Spin Wave Propagation in Polycrystalline YIG Thin Films Prepared by Coprecipitation Method
YAMADA, Keisuke, Materials Chemistry Course, Department of Chemistry and Biomolecular Science, Graduate School of Engineering, Gifu University
Host in iJURC ONO, Teruo
- Control of Malignant Behavior of Colorectal Cancer by Antitumoral Cell Penetrating Peptide (CPP)
OHASHI, Wakana, Department of Pharmaceutical Sciences, Keio University
Host in iJURC FUTAKI, Shiroh F
- Anomalous Hall Effect of Ultrathin Pt Films Grown on Magnetic Oxide
NAGAHAMA, Taro, Solid State Chemistry Laboratory, Faculty of Engineering, Hokkaido University
Host in iJURC ONO, Teruo
- Synthesis and Study of Oxides with Unusually High-valent Cation
SAITO, Takashi, High Energy Accelerator Research Organization (KEK)
Host in iJURC SHIMAKAWA, Yuichi
- Prediction of Charge Transport Mobilities of Organic p-Type Semiconductors based on Multiscale Simulation
KIDO, Junji, Department of Organic Device Engineering, Yamagata University
Host in iJURC KAJI, Hironori
- Development of Novel π -Conjugated Polymers by DArP and Their Application to Organic Photovoltaics
OSAKA, Itaru, Graduate School of Engineering, Hiroshima University
Host in iJURC WAKIOKA, Masayuki
- Spin and Valence Electron Dependent Au₂₅ Ferromagnetic Single-electron Transistor
MAJIMA, Yutaka, Materials and Structures Laboratory, Tokyo Institute of Technology
Host in iJURC TERANISHI, Toshiharu
- Manufacture of Nano-scale Shallow NV Centers in Diamond
TOKUDA, Norio, Nanomaterials Research Institute, Kanazawa University
Host in iJURC MIZUOCHI, Norikazu
- Electrical Control and Detection of Spin of NV Center
MAKINO, Toshiharu, National Institute of Advanced Industrial Science and Technology (AIST)
Host in iJURC MIZUOCHI, Norikazu

Theoretical Study on Chemoselective Acylation Catalyzed by 4-Pyrrolidinopyridine Derivatives
YAMANAKA, Masahiro, Department of Chemistry, Rikkyo University
Host in iJURC KAWABATA, Takeo

SUBJECTS FOCUSING OF JOINT USAGE OF iJURC/ICR FACILITIES

Study on the Mechanism of the Crystal Structural Evolution of Polydimethylsiloxane
LI, Liangbin, National Synchrotron Radiation Laboratory, University of Science and Technology of China
Host in iJURC TOSAKA, Masatoshi [I]

High-pressure Synthesis of Potential Multiferroic Oxides
JI, Kunlang, Centre for Science at Extreme Conditions and School of Chemistry, University of Edinburgh
Host in iJURC SHIMAKAWA, Yuichi [I]

Micro- and Nano-structural Characterization by Advanced Transmission Electron Microscopy of Novel Functional Materials for Battery Development
CHAIRUANGSR, Torranin, Industrial Chemistry, Chiang Mai University
Host in iJURC KURATA, Hiroki [I]

Electron Energy Loss Spectroscopy Analysis of Hexagonal Multilayer Graphene
WEN, Cheng-Yen, Department of Materials Science and Engineering, National Taiwan University
Host in iJURC KURATA, Hiroki [I]

Electronic Excitations in Charge-density-wave Systems
CHU, Ming-Wen, Center for Condensed Matter Sciences, National Taiwan University
Host in iJURC KURATA, Hiroki [I]

Synthesis and Characterization of Novel Organoselenium and -tellurium Compounds
MINOURA, Mao, Department of Chemistry, College of Science, Rikkyo University
Host in iJURC TOKITOH, Norihiro [I]

Elucidation of the Fluorous Interactions in the Crystal Structures of Fluorine-containing Conjugated Molecules by the Single-crystal X-ray Structural Analysis
AGOU, Tomohiro, Department of Materials Science and Engineering, College of Engineering, Ibaraki University
Host in iJURC TOKITOH, Norihiro

Synthesis and Structural Characterization of Low-valent Species of Heavier Group 14 Elements
MATSUO, Tsukasa, Faculty of Science and Engineering, Kindai University
Host in iJURC TOKITOH, Norihiro

Development of Functional Group Analysis on the Surface of Carbon Materials Using DNP-NMR
GOTOH, Kazuma, Department of Chemistry, Faculty of Science, Okayama University
Host in iJURC KAJI, Hironori

Theoretical Design of Planar Silicene Nanoribbons and Search for New Operating Principles
TAKAHASHI, Masae, Graduate School of Agricultural Science, Tohoku University
Host in iJURC TOKITOH, Norihiro [F]

High Accuracy Measurement of Hydrogen and Helium Behavior in Plasma Facing Materials for Nuclear Fusion Devices
MIYAMOTO, Mitsutaka, Interdisciplinary Faculty of Science and Engineering, Shimane University
Host in iJURC KURATA, Hiroki

Synthesis and Structures of Cationic Aromatics Bearing Thiopyrylium Units
NAGAHORA, Noriyoshi, Department of Chemistry, Faculty of Science, Fukuoka University
Host in iJURC TOKITOH, Norihiro

Analysis of Chemical Properties and Origins of Organic Matter in Lakes and Soils Using FT-ICR-MS
FUSE, Yasuro, Faculty of Molecular Chemistry and Engineering, Kyoto Institute of Technology
Host in iJURC NAKAMURA, Masaharu

STEM-EELS Analysis of Bound Excitons at Defects in Two-dimensional Materials
SAITO, Hikaru, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University
Host in iJURC KURATA, Hiroki

SUBJECTS ENCOURAGING JOINT PROGRAM

Determine the Three-dimensional Structure of ¹³C Labeled α -Synuclein(61-95) in the Langmuir-Blodgett Film and Supported Phospholipids Bilayers by p-MAIRS FT-IR
WANG, Chengshan, Chemistry, Middle Tennessee State University
Host in iJURC HASEGAWA, Takeshi [I]

Hydrophilic Dendrimers as Additive for Polyvinylidene difluoride Based Membranes
SEMSARILAR, Mona, Institut Europeen des Membranes (IEM), CNRS
Host in iJURC YAMAGO, Shigeru [I]

Resolving Percolation Dynamics Responsible for Mechanical Reinforcement in Polymer Nanocomposites Under Uniaxial Stretching
KOGA, Tadanori, Department of Material Science and Chemical Engineering, Stony Brook University
Host in iJURC TAKENAKA, Mikihito [I]

The 16th International Workshop for East Asian Young Rheologists
INOUE, Tadashi, Department of Macromolecular Science, Osaka University
Host in iJURC MATSUMIYA, Yumi [I]

iJURC Publications (Selected Examples)

(until 31 May 2020)

Reversible Isomerizations between 1,4-Digermabenzenes and 1,4-Digerma-Dewar-benzenes: Air-stable Activators for Small Molecules

Sugahara, T.; Guo, J.-D.; Hashizume, D.; Sasamori, T.; Tokitoh, N., *J. Am. Chem. Soc.*, **141**, 2263-2267 (2019).

Abstract

The first examples of stable, crystalline, and air-sensitive 1,4-digermabenzenes were isolated. These species photochemically isomerize into the corresponding air-stable digerma-Dewar-benzenes. More importantly, alkyl-substituted Dewar-type-1,4-digermabenzenes can be considered as reversible "air-stable activators" for small molecules such as dihydrogen, carbon dioxide, and acetylene at room temperature. The regeneration of these activators can be accomplished via a thermal retro-isomerization that affords the corresponding 1,4-digermabenzenes.

H₂O/Olefinic- π Interaction inside a Carbon Nanocage

Hashikawa, Y.; Murata, Y., *J. Am. Chem. Soc.*, **141**, 12928-12938 (2019).

Abstract

The H₂O/CH₂=CH₂-type hydrogen-bonding (H-bonding) model was experimentally constructed using a water complex of an open-cage C₆₀ derivative, in which an olefinic double bond and a single molecule of H₂O are geometrically confined. To investigate OH/ π -type H-bonding, that is, H₂O \cdots (C=C) interaction, we performed ¹H NMR spectroscopic studies that demonstrated the monotonic downfield shift of the proton signal corresponding to H₂O with remarkable rotational perturbation by lowering the temperature. From the temperature dependence of the angular momentum correlation time (τ_j), the interaction energy was quantitatively estimated to be ca. 0.3 kcal/mol. The computational studies were thoroughly conducted to clarify its inherent nature. As a consequence, the orientation of H₂O was found to play a prominent role in varying the bonding strength as well as contribution from the electrostatic attraction and orbital-orbital interaction significantly driven by the favorable orbital overlap identified as $\pi(\text{C}=\text{C}) \rightarrow \sigma^*(\text{OH})$ interaction.

Bulk Dzyaloshinskii-Moriya Interaction in Amorphous Ferrimagnetic Alloys

Kim, D.-H.; Haruta, M.; Ko, H.-W.; Go, G.; Park, H.-J.; Nishimura, T.; Kim, D.-Y.; Okuno, T.; Hirata, Y.; Futakawa, Y.; Yoshikawa, H.; Ham, W.; Kim, S.; Kurata, H.; Tsukamoto, A.; Shiota, Y.; Moriyama, T.; Choe, S.-B.; Lee, K.-J.; Ono, T., *Nat. Mater.*, **18**, 685-690 (2019).

Abstract

Symmetry breaking is a fundamental concept that prevails in many branches of physics. In magnetic materials, broken inversion symmetry induces the Dzyaloshinskii-Moriya interaction (DMI), which results in fascinating physical behaviours with the potential for application in future spintronic devices. Here, we report the observation of a bulk DMI in GdFeCo amorphous ferrimagnets. The DMI is found to increase linearly with an increasing thickness of the ferrimagnetic layer, which is a clear signature of the bulk nature of DMI. We also found that the DMI is independent of the interface between the heavy metal and ferrimagnetic layer. This bulk DMI is attributed to an asymmetric distribution of the elemental content in the GdFeCo layer, with spatial inversion symmetry broken throughout the layer. We expect that our experimental identification of a bulk DMI will open up additional possibilities to exploit this interaction in a wide range of materials.

Dielectric Relaxation of Type-A Chains Undergoing Head-to-Tail Association/Dissociation: Difference from Head-to-Head Case and Correlation with Viscoelastic Relaxation

Kwon, Y.; Matsumiya, Y.; Watanabe, H., *Macromolecules*, **52**, 8484-8502 (2019).

Abstract

Dielectric relaxation of type-A chains reflects global motion of the chains but is also affected by relative alignment of the dipoles along the chain backbone, namely, by the dipole inversion. Head-to-head association of type-A unimers gives a symmetrically dipole-inverted dimer, and the association/dissociation equilibrium of these unimers and dimer results in motional coupling of these chains, thereby affecting the dielectric behavior. In fact, for this head-to-head case, eigenmode analysis has been reported in the literature to reveal that motional coupling results in moderate retardation and acceleration of the dielectric relaxation of the unimer and dimer obeying the reptation dynamics. In contrast, the coupling has no effect on the dielectric relaxation of the Rouse unimer and dimer, namely, the effect of motional coupling on the dielectric relaxation changes with the type of chain dynamics. This effect was not clarified for head-to-tail associating unimers and their dimer having no dipole inversion. Thus, for completeness, this study makes the eigenmode analysis of the dielectric relaxation for this case of head-to-tail reaction. For the unimer and dimer obeying either Rouse or reptation dynamics, the analysis indicates that the retardation and acceleration of the dielectric relaxation of the unimer and dimer are much more significant for the head-to-tail case than for the head-to-head case irrespective of the chain dynamics, and that the dielectric relaxation function for the former case exactly coincides with the viscoelastic relaxation function if the unimer and dimer obey the reptation dynamics. This result suggests an interesting method of resolving some detail of the chain dynamics under the reaction through comparison of dielectric and viscoelastic responses of the associative type-A chains.

Probabilistic Controllability Approach to Metabolic Fluxes in Normal and Cancer Tissues

Schwartz, J.-M.; Otokuni, H.; Akutsu, T.; Nacher, J. C., *Nat. Commun.*, **10**, 2725 (2019).

<https://doi.org/10.1038/s41467-019-10616-z>

Abstract

Recent research has shown that many types of cancers take control of specific metabolic processes. We compiled metabolic networks corresponding to four healthy and cancer tissues, and analysed the healthy-cancer transition from the metabolic flux change perspective. We used a Probabilistic Minimum Dominating Set (PMDS) model, which identifies a minimum set of nodes that act as driver nodes and control the entire network. The combination of control theory with flux correlation analysis shows that flux correlations substantially increase in cancer states of breast, kidney and urothelial tissues, but not in lung. No change in the network topology between healthy and cancer networks was observed, but PMDS analysis shows that cancer states require fewer controllers than their corresponding healthy states. These results indicate that cancer metabolism is characterised by more streamlined flux distributions, which may be focused towards a reduced set of objectives and controlled by fewer regulatory elements.