



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

iJURC Cooperative Research Subjects 2019

(1 April 2019 ~ 31 March 2020)

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

Ultra Directional Neutron Beam Generation by Using Laser Driven X-ray and Spin Polarized Deuterium Target
ARIKAWA, Yasunobu, Institute of Laser Engineering, Osaka University
Host in iJURC INOUE, Shunsuke I

Probing Ultrafast Motion of Critical Surface Pushed by Multi-pico-second Relativistic Radiation Pressure
FUJIOKA, Shinsuke, Institute of Laser Engineering, Osaka University
Host in iJURC INOUE, Shunsuke

Development of New Target Material Using CNT
OHNISHI, Tetsuya, Nishina Center for Accelerator Based Science, RIKEN
Host in iJURC WAKASUGI, Masanori

Laser Driven Ion Acceleration Experiment Using Carbonized Thin Tape Target
KONDO, Kotaro, Kansai Photon Science Institute, National Institutes for Quantum and Radiological Science and Technology
Host in iJURC HASHIDA, Masaki

Catalysis 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

Development of Iron-catalyzed Strategies for Diversity Oriented Synthesis of Heterocycles and Carbocycles
HAJRA, Alakananda, Department of Chemistry, Visva-Bharati University
Host in iJURC NAKAMURA, Masaharu I

Iron-Catalyzed Carbometalation of Heterobicyclic Alkenes: Development of Asymmetric Reactions and Application to Synthesis of Polycyclic Aromatic Hydrocarbons
ITO, Shingo, School of Physical and Mathematical Sciences, Nanyang Technological University
Host in iJURC NAKAMURA, Masaharu I

Open-cage Fullerenes Incorporating Hydrogen as n-Type Composite Materials for Polymer Solar Cell Applications
CHUANG, Shih-Ching, Department of Applied Chemistry, National Chiao Tung University
Host in iJURC MURATA, Yasujiro I

Development of Mid-infrared Laser and Applications to Nano-material Sciences
ITATANI, Jiro, The Institute for Solid State Physics, The University of Tokyo
Host in iJURC KANEMITSU, Yoshihiko

Study on the Mechanism for the Stability of an In-doped Novel Fe-Pd Phase
TATETSU, Yasutomi, Liberal Arts Organization, Meio University
Host in iJURC TERANISHI, Toshiharu

Development of the Novel Functional Paint Using Metallic Uru-shiol Complexes
TACHIBANA, Yoichi, Kyoto Municipal Institute of Industrial Technology and Culture
Host in iJURC NAKAMURA, Masaharu

Photocurrent of Pb Perovskite Solar Cells by Heterodyne Interference Spectroscopy
OGAWA, Yoshihiro, Joetsu University of Education
Host in iJURC KANEMITSU, Yoshihiko

Network Analyses for Data-driven Exploration and Hypothesis Testing in Microbial Ecology
CHAFFRON, Samuel, Laboratoire des Sciences du Numérique de Nantes (LS2N), Centre National de la Recherche Scientifique (CNRS)
Host in iJURC BLANC-MATHIEU, Romain I

Distribution of Prasinoviruses and Their Association with Natural Hosts in the Global Ocean
GRIMSLEY, Nigel, Sorbonne University
Host in iJURC ENDO, Hisashi I

Viral Impacts on Microbial Ecosystems in the Highly-enclosed Inlet, Uranouchi Bay, Kochi
NAGASAKI, Keizo, Faculty of Agriculture and Marine Science, Kochi University
Host in iJURC ENDO, Hisashi

Isolation of New Giant Viruses and Their Genomic and Transcriptomic Characterization
TAKEMURA, Masaharu, Faculty of Science, Tokyo University of Science
Host in iJURC OGATA, Hiroyuki

Concentration of Bloom Forming Algae from Environmental Samples and Identification of the Viruses Infecting the Alga
YOSHIDA, Takashi, Faculty of Agriculture, Kyoto University
Host in iJURC OGATA, Hiroyuki

Exhaustive Analysis of Local Structural Changes of Biological Networks
SHIGA, Motoki, Informatics Course, Department of Electrical, Electronic and Computer Engineering, Faculty of Engineering, Gifu University
Host in iJURC MAMITSUKA, Hiroshi

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

Application of s-Tetrazines in Guanidine Functionalization of Fullerenes
MARGETIC, Davor, Division of Organic Chemistry and Biochemistry, Rudjer Boskovic Institute
Host in iJURC MURATA, Yasujiro I

I: International Joint Research

F: Female PI

Preparation of Novel Branched Block Copolymer with Well-controlled Stereoregularity and Evaluation of Its Molecular Aggregation State

HIRAI, Tomoyasu, Department of Applied Chemistry, Osaka Institute of Technology

Host in iJURC TAKENAKA, Mikihito

Study of Anchoring Behavior of Chiral Nematic Liquid Crystal

AKAGI, Kazuo, Research Organization of Science and Technology, Ritsumeikan University

Host in iJURC TSUJII, Yoshinobu

Application of $\delta^{98/95}\text{Mo}$ and $\delta^{186/184}\text{W}$ Isotopes Ratios for the Reconstruction of Late Miocene Oxygenation in the Arabian Sea

GUNDIGA PUTTOJIRAO, Gurumurthy, Geochemistry Research Lab, Birbal Sahni Institute of Palaeosciences

Host in iJURC SOHRIN, Yoshiki

Investigation on the Decay Process of Hot Carriers in Heavily Doped Semiconductor Nanocrystals

DOUHAL, Abderrazzak A., Physical Chemistry, University of Castilla-La Mancha (UCLM)

Host in iJURC SAKAMOTO, Masanori

Elongational Rheology of Telechelic-type Ionomers

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

Host in iJURC MATSUMIYA, Yumi

Study on Transportation and Separation of Metal Ions Through a Liquid Membrane Using Ionic Liquid

MUKAI, Hiroshi, Faculty of Education, Kyoto University of Education

Host in iJURC SOHRIN, Yoshiki

Study on Gelation Behaviors of Polymer Oleogels

OSAKA, Noboru, Graduate School of Science, Okayama University of Science

Host in iJURC TAKENAKA, Mikihito

Investigation on the Carrier Relaxation Processes of Quantum Dots Protected with Functional Organic Molecules

TAMAI, Naoto, School of Science and Technology, Kwansai Gakuin University

Host in iJURC SAKAMOTO, Masanori

Preparation and Mechanical Properties of Noncovalent Bonded Elastomers Based on Styrenic Block Copolymers

NORO, Atsushi, Graduate School of Engineering, Nagoya University

Host in iJURC WATANABE, Hiroshi

EXPANDING SUBJECTS

(IN SPECIFIC FIELDS CHOSEN BY iJURC)

Advanced Functionality on Materials Induced by Intense THz Pulse Irradiation

NAGASHIMA, Takeshi, Faculty of Science and Engineering, Setsunan University

Host in iJURC HASHIDA, Masaki

Research on the High-performance Superconducting Cavity and the Cost Reduction by Noble Inner-surface Processes

SAEKI, Takayuki, Accelerator Division VI, High Energy Accelerator Research Organization

Host in iJURC IWASHITA, Yoshihisa

Study on Magnification of the Pulsed-neutron Transmission Image Using the Sextupole Magnet, Aimed at Visualization of Charge and Discharge in the Electrode Materials of Li-ion Batteries

KINO, Koichi, Research Institute for Measurement and Analytical Instrumentation, Advanced Industrial Science and Technology

Host in iJURC IWASHITA, Yoshihisa

Controlling Chiral Structure of Au Nanowires by Enantiomeric Excess

KAWAI, Takeshi, Faculty of Engineering, Tokyo University of Science

Host in iJURC KURATA, Hiroki

Crystal Structure Analysis of GraE Protein from Root-Nodule-Forming Bacterium

OIKAWA, Tadao, Faculty of Chemistry, Materials and Bioengineering, Kansai University

Host in iJURC FUJII, Tomomi

Enhanced Production of Fast Ions by TNSA with Pre-pulse Laser

SUNAHARA, Atsushi, Institute of Laser Engineering, Osaka University

Host in iJURC INOUE, Shunsuke

Fundamental Study on Micro-fabrication of Si with Controlling Laser Absorption

KUSABA, Mitsuhiro, Electronics, Information and Communication Engineering, Osaka Sangyo University

Host in iJURC HASHIDA, Masaki

Development of a Fast and Efficient Neutron Trigger Device for Electron-RI Scattering Experiments

ENOKIZONO, Akitomo, Nishina Center for Accelerator Based Science, RIKEN

Host in iJURC WAKASUGI, Masanori

Optimization of Fabrication Process of a Superconducting Electron Accelerating Cavity Operated by Small Electricity Power for a CEP-stabilized Free-Electron Laser

HAJIMA, Ryoichi, Quantum Beam Science Research Division, National Institutes for Quantum and Radiological Science and Technology

Host in iJURC IWASHITA, Yoshihisa

High Pressure Approach to the Synthesis of Novel Ferroelectric Photovoltaic Transition Metal Oxides

CHEN, Wei-Tin, Center for Condensed Matter Sciences, National Taiwan University

Host in iJURC SHIMAKAWA, Yuichi

Small Molecule Activation Using Anionic Crypto-FLPs

STREUBEL, Rainer, Institute for Inorganic Chemistry, University of Bonn

Host in iJURC TOKITOH, Norihiro

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

Mechanistic Studies of C-H Bond Functionalization Reactions Catalyzed by 3d Transition Metals

YOSHIKAI, Naohiko, Division of Chemistry and Biological Chemistry, School of Physical and Mathematical Sciences, Nanyang Technological University

Host in iJURC NAKAMURA, Masaharu

Study on Nickelate Complexes Constructed by a Monoanionic Tridentate Pincer-type Ligand

YAMAGUCHI, Yoshitaka, Faculty of Engineering, Division of Materials Science and Chemical Engineering, Yokohama National University

Host in iJURC NAKAMURA, Masaharu

Mechanistic and Synthetic Studies of Poly((meth)acrylonitrile) Chain End Radicals

NAKAMURA, Yasuyuki, Research and Services Division of Materials Data and Integrated System, National Institute for Materials Science

Host in iJURC YAMAGO, Shigeru

Creation of Effective Oxidation Scavenger for Efficient Perovskite-based Solar Cells

SASAMORI, Takahiro, Graduate School of Natural Sciences, Nagoya City University

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/Institute of Bioinformatics & Systems Biology, National Chiao Tung University

Host in iJURC AKUTSU, Tatsuya

Next-generation Bioinformatics Approaches for the Accurate Identification of Protease-specific Substrate Cleavage Sites

SONG, Jiangning, Monash Biomedicine Discovery Institute, Monash University

Host in iJURC AKUTSU, Tatsuya

Statistical Machine Learning Methods for Molecular Network Analysis

KAYANO, Mitsunori, Research Center for Global Agromedicine, Obihiro University of Agriculture and Veterinary Medicine

Host in iJURC MAMITSUKA, Hiroshi

Coupling of Planar and Curved π -Systems for the Development of Novel Functional Materials

NARITA, Akimitsu, Max Planck Institute for Polymer Research

Host in iJURC HIROSE, Takashi

Design, Synthesis, and Characterization of Charge Transport Materials for Non-lead Perovskite

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

Host in iJURC WAKAMIYA, Atsushi

Development of Novel π -Conjugated Polymers and Their Application to Organic Photovoltaics

OSAKA, Itaru, Graduate School of Engineering, Hiroshima University

Host in iJURC WAKIOKA, Masayuki

Molecular Engineering of Organic Semiconductors Toward the Control of Molecular Packing in Thin Films via a Thermal Precursor Approach

SUZUKI, Mitsuharu, Graduate School of Engineering, Osaka University

Host in iJURC MURATA, Yasujiro

Synthesis and Properties of π -Conjugated Zwitterions Composed of an Electron-Donating Anion and an Electron-Accepting Cation

SHIMIZU, Akihiro, Department of Materials Engineering Science Graduate School of Engineering Science, Osaka University

Host in iJURC HIROSE, Takashi

The Elemental and Isotopic Composition of Particulate Trace Metals in the Subarctic Pacific Ocean: Sources and Internal Cycling

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

Host in iJURC SOHRIN, Yoshiki

Development of Photocatalytic Materials by Quantitative Charge Carrier Dynamics and Structural Analysis

TACHIBANA, Yasuhiro, School of Engineering, RMIT University

Host in iJURC TERANISHI, Toshiharu

High Frequency Rheological and Dielectric Response of Polymeric Liquids

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

Host in iJURC WATANABE, Hiroshi

Study on the Origin and Generation Mechanism of Urban Atmospheric Aerosol

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

Host in iJURC SOHRIN, Yoshiki

Characterization of Physical Properties and Structure of Partially Fluorinated Phospholipid Membrane

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

Host in iJURC HASEGAWA, Takeshi

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

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

OHASHI, Yohei, MRC Laboratory of Molecular Biology, University of Cambridge

Host in iJURC AOYAMA, Takashi

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

Micro- and Nano-structural Characterization by Advanced Transmission Electron Microscopy of Novel Functional Materials for Battery Development

CHAIRUANGSRI, Torranin, Industrial Chemistry, Chiang Mai University

Host in iJURC KURATA, Hiroki

Construction of Low-temperature Protein Expression System by Using Cold-adapted Microorganisms

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

Host in iJURC KURIHARA, Tatsuo

Determine the Three-dimensional Structure of ^{13}C Labeled α -Synuclein(61-95) in the Langmuir-Blodgett Film and Supported Phospholipids Bilayers by p-MAIRS FT-IR

WANG, Chengshan, Middle Tennessee State University

Host in iJURC HASEGAWA, Takeshi

Effect of Dipole Alignment along Chain Backbone on Dielectric Relaxation of Type-A Polymers at Association/Dissociation Equilibrium

KWON, Youngdon, School of Chemical Engineering, Sungkyunkwan University

Host in iJURC MATSUMIYA, Yumi I

Study on the Regulatory Network of Plant Epidermal Cell Differentiation

TOMINAGA, Rumi, Graduate School of Biosphere Science, Hiroshima University

Host in iJURC AOYAMA, Takashi F

Investigation of Magnetic and Electric Properties of Cobalt Ferrite Films for Development of High Spin-polarized Current Source

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

Host in iJURC ONO, Teruo

Giant Isotope Effects of Deuterium Atoms Terminating on Nanocrystalline Silicon and Their Use

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

Host in iJURC KANEMITSU, Yoshihiko

Synthesis and Biological Evaluation of Antitumor Cyclic Octadepsipeptide Containing α -Fluorinated Amino Acid

NAGASAWA, Hideko, Gifu Pharmaceutical University

Host in iJURC KAWABATA, Takeo F

Studies on Total Synthesis of Gonytolides

YOSHIMURA, Tomoyuki, Graduate School of Medical Sciences, Kanazawa University

Host in iJURC KAWABATA, Takeo

Studies on the Physiological Significance of Two Alanine Dehydrogenases in *Geobacillus kaustophilus*

OMORI, Taketo, Faculty of Engineering, Osaka Institute of Technology

Host in iJURC KURIHARA, Tatsuo

Synthesis and Study of Oxides with Unusually High-valent Cation

SAITO, Takashi, Institute of Materials Structure Science, High Energy Accelerator Research Organization KEK

Host in iJURC SHIMAKAWA, Yuichi

Application of Surfactant for Extraction of Platinum Group Elements Using Solvent Impregnated Resin

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

Host in iJURC SOHRIN, Yoshiki

Manipulation of Three Dimensional Structure of Porous Polymer Composites Controlled by Additive Manufacturing

MURASE, Hiroki, Faculty of Home Economics, Kyoritsu Women's University

Host in iJURC TSUJII, Yoshinobu

Investigation of New Anti-lust Surfactant Containing a Perfluoroalkyl Chain and an Amino Acid Head Group

YAMADA, Norihiro, Faculty of Education, Chiba University

Host in iJURC HASEGAWA, Takeshi

Ring-size-dependent Excitation Dynamics of Cycloparaphenylenes

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

Host in iJURC YAMAGO, Shigeru

Nonlinear Rheology of Semiflexible Polymer Solutions

INOUE, Tadashi, Graduate School of Science, Osaka University

Host in iJURC MATSUMIYA, Yumi

Analysis of Soret Effect for DNA in Molecular-Scale Temperature Gradient

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

Host in iJURC WATANABE, Hiroshi F

EXPANDING SUBJECTS

(ON-DEMAND FROM RELATED COMMUNITIES)

Regulatory Network of Gene Expression for Plant Cell Morphogenesis

QU, Li-Jia, School of Life Sciences, Peking University

Host in iJURC AOYAMA, Takashi I

Site-Selective Protein Acetylation by a Small Molecule

ZHOU, Lu, School of Pharmacy, Fudan University

Host in iJURC UESUGI, Motonari I

Study of Magnonic Properties of Ferrimagnets

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 as Sensitizer

ZHANG, Dongdong, Department of Chemistry, Tsinghua University

Host in iJURC KAJI, Hironori I

Highly Efficient Blue Thermally Activated Delayed Fluorescence Emitters Using Sterically Hindered Donor Skeleton

KWON, Jang Hyuk, Department of Information Display, Kyung Hee University

Host in iJURC KAJI, Hironori I

Structural Analysis of Organic Amorphous Thin Films Using Solid Effect Dynamic Nuclear Polarization NMR

KOBAYASHI, Takeshi, Ames National Laboratory, U.S. Department of Energy

Host in iJURC KAJI, Hironori I

Memory of Chirality Using Flow Electrochemistry

WIRTH, Thomas, School of Chemistry, Cardiff University

Host in iJURC KAWABATA, Takeo I

Creation of Functional Molecules Based on Hydrogen Bond Networks

CLAYDEN, Jonathan, School of Chemistry, University of Bristol

Host in iJURC KAWABATA, Takeo I

Structural and Functional Analysis of the Surface Components of Bacterial Outer Membrane Vesicles

CORSARO, Maria Michela, Department of Chemical Sciences, University of Naples Federico II

Host in iJURC KURIHARA, Tatsuo I F

Search for Four-wave-mixing in the Vacuum –Unveiling Dark Components in the Universe–

HOMMA, Kensuke, Graduate School of Science, Hiroshima University

Host in iJURC SAKABE, Shuji I

Development of Biosensors by Combining Stimuli-Responsive Polymer Brushes with Electrochemical Analysis
MA, Ying, Department of Chemistry and Chemical Engineering, South China University of Technology
Host in iJURC OHNO, Kohji I

Exploring New Polyether Nanocomposite Electrolytes to Enhance Energy Storage of Lithium Ion Batteries
FERRIER, Robert C., Chemical Engineering and Materials Science, Michigan State University
Host in iJURC OHNO, Kohji I

Fluorinated Polymer-Brush-Grafted Nanoparticles: Precise Synthesis and Applications to Membrane Technology
LADMIRAL, Vincent, Institut Charles Gerhardt (ICGM), CNRS
Host in iJURC OHNO, Kohji I

Real-time Imaging of Single-molecule mRNA with Different Methylation States
STASEVICH, Timothy J., Department of Biochemistry and Molecular Biology, Colorado State University
Host in iJURC IMANISHI, Miki I

Structural and Functional Analysis of Curvature-inducing Peptides
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

Research of Multi-qubit Diamond Quantum Processors
DOHERTY, W. Marcus, Research School of Physics and Engineering, Australian National University
Host in iJURC MIZUOCHI, Norikazu I

Research on Shallow NV Center in Diamond
BALASUBRAMANIAN, Gopalakrishnan, Max-Planck Institute for Biophysical Chemistry
Host in iJURC MIZUOCHI, Norikazu I

New Cellular Functions of Acyldopamine
ITO, Akihiro, School of Life Sciences, Tokyo University of Pharmacy and Life Sciences
Host in iJURC UESUGI, Motonari

Modulation of New Cellular Functions of Vitamin D
NAGASAWA, Kazuo, Department of Biotechnology and Life Science, Tokyo University of Agriculture and Technology
Host in iJURC UESUGI, Motonari

Development of the Epitaxial Thin Film of Weyl Semimetal Mn₃Sn
NAGAHAMA, Taro, Faculty of Engineering, Hokkaido University
Host in iJURC ONO, Teruo

Effect of Microstructure on Damping Constant in Polycrystalline Bi-YIG Thin Films Prepared by Sol-Gel Method
YAMADA, Keisuke, Faculty of Engineering, Gifu University
Host in iJURC ONO, Teruo

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

Analysis of the Physiological Functions of Membrane 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

Fine Synthesis of Polymer Brush on Ferromagnetic Nano-Platelet for Ferromagnetic Photonic LC
UCHIDA, Yoshiaki, Department of Materials Engineering Science, Graduate School of Engineering Science, Osaka University
Host in iJURC OHNO, Kohji

Ferromagnetic Single-electron Transistor
MAJIMA, Yutaka, Laboratory for Materials and Structures, Institute of Innovative Research, Tokyo Institute of Technology
Host in iJURC TERANISHI, Toshiharu

Development of NanoBRET-based Screening System for Peptidic CXCR4 Ligands
NOMURA, Wataru, School of Pharmaceutical Sciences, Hiroshima University
Host in iJURC FUTAKI, Shiroh

Establishment of Cell Penetrating Peptide (CPP)-based Delivery System into Resident Cancer Stem Cells in Deep Cancer Tissue
OHASHI, Wakana, Graduate School of Medicine and Pharmaceutical Sciences for Research, University of Toyama
Host in iJURC FUTAKI, Shiroh F

Manufacture of Shallow NV Centers in Diamond
TOKUDA, Norio, Nanomaterials Research Institute, Kanazawa University
Host in iJURC MIZUOCHI, Norikazu

Electrical Control and Detection of Qubit of NV Center
MAKINO, Toshiharu, Energy Technology Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)
Host in iJURC MIZUOCHI, Norikazu

SUBJECTS FOCUSING OF JOINT USAGE OF iJURC/ICR FACILITIES

Atomic Level Analysis and Fabrication of Highly Stable Perovskite Films and Light Emitting Diodes
QIAO, Juan, Department of Chemistry, Tsinghua University
Host in iJURC KAJI, Hironori I F

High-pressure Synthesis of Potential Multiferroic Oxides
ATTFIELD, J. Paul, Centre for Science at Extreme Conditions and School of Chemistry, University of Edinburgh
Host in iJURC SHIMAKAWA, Yuichi I

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

Nano-electron Spectroscopic Study on 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

Plasmon-exciton Coupling on a Plasmonic Crystal
SAITO, Hikaru, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University
Host in iJURC KURATA, Hiroki

Design of Flat Silicene with Perfect π -Conjugate 2D Sheet
TAKAHASHI, Masae, Graduate School of Agricultural Science, Tohoku University
Host in iJURC TOKITOH, Norihiro F

Synthesis and Structures of Acene Molecules Bearing Chalcogenopyrylium Units
NAGAHORA, Noriyoshi, Department of Chemistry, Faculty of Science, Fukuoka University
Host in iJURC TOKITOH, Norihiro

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

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; MIZUHATA, Yoshiyuki

High Sensitive Imaging Mass Spectrometry Targeting the Carbonyl Compounds Derived from Biological Tissues
HATANO, Osamu, Department of Anatomy and Cell Biology, Nara Medical University
Host in iJURC ISOZAKI, Katsuhiko

SUBJECTS ENCOURAGING JOINT PROGRAM

Fabrication of Nanotopographical Polymer Surfaces with Bactericidal Properties
ENDOH, Maya K., Department of Material Science and Chemical Engineering, Stony Brook University
Host in iJURC TAKENAKA, Mikihito I F

Synthesis of Structurally Controlled Polymers Having Green Fluorescence Protein Chromophore and Their Photophysical Properties in Solution
YANG, Jye-Shane, Department of Chemistry, National Taiwan University
Host in iJURC YAMAGO, Shigeru I

Vinyl Azides as New Monomers of Radical Polymerization for the Fabrication of Green Polymers Having Chemically- and Biodegradable Properties
CHIBA, Shunsuke, Division of Chemistry and Biological Chemistry, School of Physical and Mathematical Sciences, Nanyang Technological University
Host in iJURC YAMAGO, Shigeru I

The 15th International Workshop for East Asian Young Rheologists
INOUE, Tadashi, Graduate School of Science, Osaka University
Host in iJURC MATSUMIYA, Yumi I

The 8th Japanese-Sino Symposium on Organic Chemistry for Young Scientists
HAMASHIMA, Yoshitaka, School of Pharmaceutical Sciences, University of Shizuoka
Host in iJURC KAWABATA, Takeo

26th International Workshop on Oxide Electronics
MATSUNO, Jobu, Department of Physics, Osaka University
Host in iJURC KAN, Daisuke

iJURC Publications (Selected Examples)

(until 31 May 2019)

2,5-Digermaselenophenes: Germanium Analogues of Selenophenes

Sugahara, T.; Sasamori, T.; Tokitoh, N., *J. Am. Chem. Soc.*, **140**, 11206-11209 (2018).

Abstract

A stable crystalline 2,5-digermaselenophene was synthesized. In contrast to hitherto reported selenophenes, this digermaselenophene exhibits a *trans*-pyramidalized structure, which is due to its electronic properties. The practical utility of this 2,5-digermaselenophene is reflected in its ability to activate dihydrogen and acetylene at room temperature in the absence of a transition-metal complex, and this behavior can be rationalized on the basis of its physicochemical properties, which are characterized by considerable electron-donating and -accepting abilities.

Strain-Induced Double Carbon–Carbon Bond Activations of Cycloparaphenylenes by a Platinum Complex: Application to the Synthesis of Cyclic Diketones

Kayahara, E.; Hayashi, T.; Takeuchi, K.; Ozawa, F.; Ashida, K.; Ogoshi, S.; Yamago, S., *Angew. Chem. Int. Ed.*, **57**, 11418-11421 (2018).

Abstract

The carbon–carbon (C–C) bond activation of [*n*]cycloparaphenylenes ([*n*]CPPs) by a transition-metal complex is herein reported. The Pt⁰ complex Pt(PPh₃)₄ regioselectively cleaves two C–C σ bonds of [5] CPP and [6]CPP to give cyclic dinuclear platinum complexes in high yields. Theoretical calculations reveal that the relief of ring strain drives the reaction. The cyclic complex was further transformed into a cyclic diketone by using a CO insertion reaction.

Adamantyl Substitution Strategy for Realizing Solution-Processable Thermally Stable Deep-Blue Thermally Activated Delayed Fluorescence Materials

Wada, Y.; Kubo, S.; Kaji, H., *Adv. Mater.*, **30**, [1705641-1]-[1705641-8] (2018).

Abstract

Highly efficient solution-processable emitters, especially deep-blue emitters, are greatly desired to develop low-cost and low-energy-consumption organic light-emitting diodes (OLEDs). A recently developed class of potentially metal-free emitters, thermally activated delayed fluorescence (TADF) materials, are promising candidates, but solution-processable TADF materials with efficient blue emissions are not well investigated. In this study, first the requirements for the design of efficient deep-blue TADF materials are clarified, on the basis of which, adamantyl-substituted TADF molecules are developed. The substitution not only endows high solubility and excellent thermal stability but also has a critical impact on the molecular orbitals, by pushing up the lowest unoccupied molecular orbital energy and triplet energy of the molecules. In the application to OLEDs, an external quantum efficiency (EQE) of 22.1% with blue emission having Commission Internationale de l'Éclairage (CIE) coordinates of (0.15, 0.19) is realized. A much deeper blue emission with CIE (0.15, 0.13) is also achieved, with an EQE of 11.2%. These efficiencies are the best yet among solution-processed TADF OLEDs of CIE $y < 0.20$ and $y < 0.15$, as far as known. This work demonstrates the validity of adamantyl substitution and paves a pathway for straightforward realization of solution-processable efficient deep-blue TADF emitters.

Viscoelastic and Dielectric Relaxation of Reptating Type-A Chains Affected by Reversible Head-to-Head Association and Dissociation

Watanabe, H.; Matsumiya, Y.; Kwon, Y., *Macromolecules*, **51**, 6476-6496 (2018).

Abstract

For entangled linear polymer having type A dipoles and undergoing head-to-head association and dissociation reaction, viscoelastic and dielectric behavior is theoretically analyzed on the basis of the reptation dynamics combined with the reaction kinetics. Specifically, for the dissociated unimer and associated dimer (indexed with $j = 1$ and 2, respectively), the normalized complex modulus $g_j^*(\omega)$ and the normalized complex dielectric permittivity $\tilde{\epsilon}_j^*(\omega)$ are analytically calculated via eigenfunction expansion of the orientational anisotropy and orientational memory defined in terms of the bond vectors \mathbf{u} of entanglement segments. The reaction activates mutual conformational transfer between the unimer and dimer. Multiple coupling occurs for the anisotropy decay modes of the unimer and dimer due to this transfer, and the viscoelastic g_1^* and g_2^* of the unimer and dimer, respectively, exhibit considerably retarded and accelerated relaxation compared to the pure reptation case. In contrast, the memory decay modes of the unimer and dimer are only pairwise coupled, so that the reaction-induced acceleration and retardation for the dielectric $\tilde{\epsilon}_1^*$ and $\tilde{\epsilon}_2^*$ are much weaker than those seen for the viscoelastic g_1^* and g_2^* . The orientational anisotropy is the tensorial, second-moment average of \mathbf{u} associated with no cancellation in the conformational transfer, whereas the orientational memory is the vectorial, first-moment average accompanied by partial cancellation, which results in the difference between g_j^* and $\tilde{\epsilon}_j^*$. This difference between g_j^* and $\tilde{\epsilon}_j^*$ is noted also for the associating/dissociating Rouse chains. Nevertheless, the reaction-induced retardation of the viscoelastic relaxation is stronger for the reptating unimer than for the Rouse unimer, whereas the reaction-induced acceleration is similar, in magnitude, for the reptating dimer and Rouse dimer. These features of g_j^* of the unimer and dimer are discussed in relation to the motional coherence along the chain backbone being present and absent in the reptation and Rouse dynamics.

Half-cycle Terahertz Surface Waves with MV/cm Field Strengths Generated on Metal Wires

Teramoto, K.; Tokita, S.; Terao, T.; Inoue, S.; Yasuhara, R.; Nagashima, T.; Kojima, S.; Kawanaka, J.; Mori, K.; Hashida, M.; Sakabe, S., *Appl. Phys. Lett.*, **113**, 051101 (2018).

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Abstract

Irradiating a metal wire with an intense femtosecond laser pulse induces a terahertz (THz) surface wave that travels along the wire. Here, the characteristics of the THz surface wave generated by the laser–wire interaction are investigated in detail by using an electro-optical method to determine the dependence of surface wave properties on laser energy and wire diameter. The surface wave is distributed by the Hankel function in the wire radial direction. On the wire surface, the electric field is estimated to be MV/cm. The peak electric field of the surface wave and the conversion efficiency from laser energy to surface wave energy are found to be proportional to the laser energy raised to the power of 0.67 and 0.3, respectively.