KIPS-ESPCI Workshop on Polymer Science 2011

28-29 November, 2011

Katsura Hall and Katsura Lounge, B-Cluster

Graduate School of Engineering, Kyoto University

Greetings from KIPS

On behalf of all members of the organizing committee, I am delighted to extend our warm welcome to all participants and attendants of the KIPS-ESPCI Workshop on Polymer Science 2011 presented by KIPS and ESPCI in collaboration with Kyoto University GCOE, and Institute of Chemical Fibers.

Since the foundation of Kyoto Institute of Polymer Science (KIPS) in 2000, we have organized 3 international symposia. We are very happy to have this workshop at Katsura campus of Kyoto University, and to name it after KIPS, which regroups over 50 members. We wish this workshop will foster the research collaboration between KIPS and ESPCI, and expand the international scientific activity of KIPS.

As the Japanese government and people in Japan continue to have terms with the tragic aftermath of the March 11 earthquake and tsunami, it seems inappropriate to focus attention anywhere else, but we do hope that our country and people will be encouraged by recognizing this workshop as strengthening the friendship between Japanese and French academies, and will persevere undauntedly in the efforts to overcome the destructions of the earthquake. I ardently hope that Japan and France will continue to promote further scientific collaboration and ever more amiable ties.

For this workshop, we have made an attempt to seek for a new interface between polymer physics and polymer chemistry by focusing on new functional materials. We sincerely thank the financial support of the companies by sending students to the annual KIPS lecture course on polymer science over the past three years. Partial support by the Global COE Program of Kyoto University for the integrated materials science is also acknowledged.

In closing, I would like to extend my appreciation to the speakers, members of the organizing committee on both KIPS and ESPCI sides, sponsors, and many dedicated volunteers, for making this workshop possible. Please accept my sincere best wishes for a memorable and inspirational gathering.

November 2011

Fumihiko Tanaka
Chairman, KIPS-ESPCI Workshop 2011

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Kyoto Institute of Polymer Science (KIPS)

It is our great pleasure and honor to have the first KIPS-ESPCI Workshop on Polymer Science (KE2011) at Katsura campus of Kyoto University on November 28–29, 2011 with many researchers from ESPCI in attendance. On this occasion I would like to briefly introduce Kyoto Institute of Polymer Science (KIPS), together with Kyoto city and Kyoto University as its background.

Kyoto was the capital city of Japan from 794 until 1868 for over 1,000 years. Hence Kyoto has many places of historical importance, such as the old imperial palace, two imperial villas, shogunate castle etc. It also preserves long-lasting old traditions in people's everyday lives. Japanese people often call Kyoto their spiritual hometown. On the other hand, Kyoto has positively accepted new cultures, sciences and technologies as illustrated by the construction of the Sosui canal for water transport, the first hydraulic electric power station in Japan, the modern JR Kyoto station, etc. Kyoto is also described as a town of colleges and universities with many students being in the town year around.

Since its foundation in 1897, Kyoto University has long been recognized as one of the best universities among about 100 national universities in Japan. In fact, five Nobel laureates graduated from Kyoto University (H. Yukawa, S. Tomonaga, K. Fukui, T. Tonegawa, and R. Noyori) among the seventeen Japanese Nobel laureates so far. As a new challenge, Kyoto University opened in 2003 a new campus called Katsura campus for both the Graduate School of Engineering and of Informatics. In 2004 all the national universities in Japan were transformed to semiprivate ones, namely to incorporated administrative agencies. Since then, Kyoto University has been performing various renovations.

The history of the Department of Polymer Chemistry in Kyoto University began in 1941, when Professor Ichiro Sakurada and Professor Masao Horio started their laboratories in the new Department of Fiber Chemistry. Professor Sakurada developed a famous Japanese synthetic fiber, "vinylon", which is poly(vinyl alcohol) modified with aldehydes. In its long history, the department has become well recognized for its significant contributions to polymer science, not only in Japan but also internationally. It has kept collaborating with many foreign affiliations, such as the University of Massachusetts at Amherst, the University of Akron, the Max Planck Institute of Polymer Research in Mainz, the National Institute of Standards and Technology, etc. Polymer scientists in Kyoto are very proud of both its achievements and the tradition of the Kyoto school. About twenty years ago, the six chemistry-related departments in the faculty of engineering were reorganized, and at present approximately 50 faculty staffs work on polymers in these departments and other ones in different campuses.

On January 1, 2000, a new association of polymer scientists was formed in Kyoto University, mainly based on the staffs at the Department of Polymer Chemistry and of Materials Chemistry. The name of the association is the Kyoto Institute of Polymer Science (KIPS). KIPS is a

nonprofit group of mutually collaborating polymer researchers in Kyoto. It has neither specific buildings nor the fixed funds allotted to it. Its main purposes are to promote polymer science through various scientific meetings, to foster the researchers of the next generation, and to contribute to the society and industries. KIPS also partners with foreign groups to hold international symposia, workshops etc, as well as to participate in the exchange of scientific information. At present over 50 professional polymer scientists and around 100 graduate students of Kyoto University belong to KIPS. Thus far KIPS has held bilateral symposia three times with the National Institute of Standards and Technology.

The past and present of KIPS, as well as Kyoto city and Kyoto University, have been described. We hope that in the future KIPS will expand its activity to various joint symposia with domestic and foreign institutions in order to further promote activity of polymer science and industry.

November 2011

Fumihiko Tanaka
Chairman, Steering Committee, KIPS

Polymer Science at ESPCI

The proposition of Professor Fumihiko Tanaka, the Chairman of the Steering Committee of KIPS to held a KIPS-ESPCI workshop on polymers was enthusiastically and gratefully welcomed by all polymer scientists at ESPCI. Such is the fame of polymer science at the Kyoto University, that the idea of the workshop stood out immediately as a great opportunity and honour. We are all extremely happy that the meeting postponed by the dramatic events of March 2011 can take place as planned.

Founded in 1882, Ecole Supérieure de Physique et Chimie Industrielles has been always under the aegis of the City of Paris. Professors and students alike cherish the close links with the city. When in 1907, Georges Urbain discovered a new element he named it *Lutetium*, from the Latin name of Paris, Lutece. From its foundation, ESPCI emerges as a leading French Grande Ecole training scientists and engineers at the graduate level. It is a renowned research institution and source of innovative ideas for industry. Famous names of professors and alumni, among whom Pierre and Marie Curie, Frederic Joliot, Paul Langevin, Pierre-Gilles de Gennes or Georges Charpak, are associated with the school. Today, ESPCI is home to 17 high-profile laboratories advancing scientific knowledge and pioneering technical know-how in a variety of research areas, ranging from polymers to telecommunications, from nanobiophysics to organic synthesis, from environmental science to biomedical imaging, from neurobiology to microfluidics, from soft matter to quantum physics, from colloids to prototyping for industry. One hundred eighty professors and permanent researchers, one hundred seventy PhD students and about hundred post-docs work at ESPCI. They publish about 380 papers/year and had 13000 citations in 2010.

Polymers have traditionally been a central research topic at ESPCI. Paul Schützenberger, the inventor of cellulose acetate, was a Director of ESPCI, and so were Georges Champtier, one of the pioneers of modern polymer chemistry in France, and Pierre-Gilles de Gennes, maybe the main figure of polymer and soft matter physics in 20^{th} century. Currently the soft matter community is one of the largest at ESPCI and encompasses about 42 professors and scientists, 46 PhD students and 24 post-docs shared among five research laboratories.

November 2011

Ludwik Leibler

Program

November 28 (Monday)

9:15-9:30 Opening
Fumihiko Tanaka (KIPS, Chairman of the Steering Committee)
Ludwik Leibler (ESPCI, Director, Soft Matter Sci. and Eng. Lab.)

Mitsuo Sawamoto (KIPS, Polymer Chemistry) Presiding

9:30-10:00 **Kazunari Akiyoshi** (KIPS, Polymer Chemistry)
Nanogel engineering by associating polymers

10:00-10:30 **Ilias Iliopoulos** (ESPCI, Soft Matter and Chemistry Lab.)
Polymer associations via molecular recognition

10:30-11:00 **Coffee**

Shigeru Yamago (KIPS, Ins. Chem. Res.) Presiding

11:00-11:30 **Yoshinobu Tsujii** (KIPS, Ins. Chem. Res.)
Newly Designed Tribomaterials Synthesized by Living Radical Polymerization

11:30-12:00 **Dominique Hourdet** (ESPCI, Soft Matter Sci. and Eng. Lab.)
Design, Structure and Mechanical Properties of Hybrid Hydrogels

12:00-13:00 **Lunch**

Shunsaku Kimura (KIPS, Material Chemistry) Presiding

13:00-13:30 **François Lequeux** (ESPCI, Soft Matter Sci. and Eng. Lab.)
Filled elastomer, gradient of glass transition temperature and mechanics

13:30-13:50 **Hideo Ohkita** (KIPS, Polymer Chemistry)
Interfacial dye sensitization in polymer solar cells

Yoshiki Chujo (KIPS, Polymer Chemistry) Presiding

13:50-14:20 **Nicolas Sanson** (ESPCI, Polymer and Dispersed Media Phys. Chem. Lab.)
Tunable, Controlled and Reversible Assemblies of Thermosensitive Polymer grafted Gold Nanoparticles

14:20-14:40 **Yasuhiro Morisaki** (KIPS, Polymer Chemistry)
Through-space Conjugated Polymers Consisting of [2.2]Paracyclophane

H. Ohkita, Y. Morisaki, F.Sanda (KIPS, Polymer Chemistry) Presiding

14:40-16:00 **Poster Preview**

16:00-17:00 **Poster Session**

17:30-19:30 **Welcome Party**

November 29 (Tuesday)

Takenao Yoshizaki (KIPS, Polymer Chemistry) Presiding

9:00-9:30 **Michel Cloitre** (ESPCI, Soft Matter and Chemistry Lab.)
Yielding and flow of soft glassy materials

9:30-9:50 **Tsuyoshi Koga** (KIPS, Polymer Chemistry)
Structure Formation and Rheology of Associating Polymers

9:50-10:10 **Yo Nakamura** (KIPS, Polymer Chemistry)
Inter- and Intramolecular Interactions of Brush-Like Polymers

10:10-10:40 **Coffee**

Fumihiko Tanaka (KIPS, Polymer Chemistry) Presiding

10:40-11:10 **Ludwik Leibler** (ESPCI, Soft Matter and Chemistry Lab.)
Strong organic liquids

11:10-11:30 **Kenji Urayama** (KIPS, Material Chemistry)
Shape Selection and Variation of Twist Nematic Elastomer Ribbons

11:30-12:00 **François Tournilhac** (ESPCI, Soft Matter and Chemistry Lab.)
Self-Assembly and Self-Healing of Supramolecular Polymers and Networks

12:00-13:00 **Lunch**

Shinzaburo Ito (KIPS, Polymer Chemistry) Presiding

13:00-13:30 **Costantino Creton** (ESPCI, Soft Matter Sci. and Eng. Lab.)
Mechanics of Soft Polymer Networks: Large Strain, Hysteresis, Fracture and Adhesion

13:30-14:00 **Kazuo Akagi** (KIPS, Polymer Chemistry)
Synthesis of Helical Conjugated Polymers in Asymmetric Liquid Crystal Reaction Field and Control of Spiral Morphology - From Helical Polyacetylene to Helical Graphite

14:00-14:20 **Makoto Ouchi** (KIPS, Polymer Chemistry)
Catalytic Precision Radical Polymerization:
Development of Highly Active Catalyst and Sequence-Controlled System

14:20-14:50 **Coffee**

Toshikazu Takigawa (KIPS, Material Chemistry) Presiding

14:50-15:20 **Elie Raphaël** (ESPCI, Theoretical Physical Chemistry Lab.)
Simple View on Fingering Instability of Debonding Soft Elastic Adhesives

15:20-15:40 **Mikihito Takenaka** (KIPS, Polymer Chemistry)
Strain-Induced Density Fluctuations in Polymeric Materials

Toshiji Kanaya (KIPS, Ins. Chem. Res.) Presiding

15:40-16:10 **Jérôme Bibette** (ESPCI, Colloids and Divided Materials Lab.)
Hydrogel Bags for Tissue Growth

16:10-16:40 **Hirokazu Hasegawa** (KIPS, Polymer Chemistry)
Network Microdomains in Block Polymers

16:40-16:50 Closing
Shinzaburo Ito (KIPS, Polymer Chemistry)

List of poster presentations

P1) Synthesis of Boron Di(iso)indomethene-Based Conjugated Polymers with High and Sharp Near-Infrared Luminescence
Ryousuke Yoshii[1], Atsushi Nagai[2], Kazuo Tanaka[1], Yoshiki Chujo[1]
[1] Graduate School of Engineering, Kyoto University
[2] Institute for Molecular Science

P2) Preparation of a pH Sensitive Molecular Assembly Composed of a A2B Type Amphiphilic Block Polypeptide
Akihiro Uesaka, Akira Makino, Shunsaku Kimura
Department of Material Chemistry, Graduate School of Engineering, Kyoto University

P3) Application of a Magnetically Oriented Microcrystal Array of Lysozyme to X-ray Structure Analysis
Fumiko Kimura, Kimihiko Mizutani, Bunzo Mikami, Tsunehisa Kimura
Graduate School of Agriculture, Kyoto University

P4) Magnetically Oriented Microcrystal Array: Single Crystal Analysis by ^{13}C Solid-State NMR Spectroscopy
Ryosuke Kusumi, Fumiko Kimura, Tsunehisa Kimura

P5) Polymerization of Substituted Acetylenes by Rhodium Catalysts Bearing Functionalized Multidentate Ligands
Naoya Onishi[1], Masashi Shiotsuki[1], Fumio Sanda[1], Toshio Masuda[2]
[1] Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University
[2] Department of Environmental and Biological Chemistry, Faculty of Engineering, Fukui University of Technology

P6) Synthesis and Secondary Structures of α-Propargyl Amino Acid Derived Novel Poly(*N*-butynylamide)s
Hiromitsu Sogawa, Masashi Shiotsuki, Fumio Sanda
Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University

P7) Single Chiral Source Based Helicity Control in the Helix-Sense-Selective Polymerization of Bis(hydroxymethyl)phenylacetylene Derivative
Jesus Rodriguez Castanon, Masashi Shiotsuki, Fumio Sanda
Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University

P8) Scattering Function of Semiflexible Rings
Ryutaro Tsubouchi, Daichi Ida, Takenao Yoshizaki
Department of Polymer Chemistry, Kyoto University

P9) Second Virial Coefficient of Polymacromonomer Consisting of Polyisoprene
Seiji Yamamoto, Kouta Inoue, Yo Nakamura
Department of Polymer Chemistry, Kyoto University

P10) Single-Molecule Conductances of Helical Peptides with Break Junction Controlled Directions of Dipole Moments

Hirotaka Uji, Tomoyuki Morita, Shunsaku Kimura
Department of Material Chemistry, Kyoto University

P11) Crystalline Nanostructure and Photophysical Properties of Regioregular Poly(3-hexylthiophene) Films
H. Benten [1] , Y. Tamai[1], H. Ohkita [1,2] , and S. Ito[1]
[1] Department of Polymer Chemistry, Kyoto University, Nishikyo-ku, Kyoto 615-8510, Japan.
[2] PRESTO, Japan Science and Technology Agency (JST), 4-1-8 Honcho Kawaguchi, Saitama 332-0012, Japan

P12) Urokinase-Immobilization on Islet Surface through DNA Hybridization for Graft Survival
Naohiro Takemoto[1], Yuji Teramura[2], Hiroo Iwata[1]
[1] Department of Reparative Materials, Institute for Frontier Medical Sciences, Kyoto University
[2] Radioisotope Research Center, Kyoto University

P13) Selective Proliferation of Neural Progenitor Cells on Polystyrene and Glass Surfaces with Immobilized Growth Factors
Shuhei Konagaya, Koichi Kato, Tadashi Nakaji-Hirabayashi, Hiroo Iwata
Department of Reparative Materials, Institute for Frontier Medical Sciences, Kyoto University

P14) Complement Activation by Polymers Carrying Hydroxyl Groups
Yusuke Arima, Masako Kawagoe, Masanori Furuta, Mitsuaki Toda, Hiroo Iwata
Department of Reparative Materials, Institute for Frontier Medical Sciences, Kyoto University

P15) 3D-TEM Study on the Novel Bicontinuous Microdomain Structures
Midori Wakabayashi
Department of Polymer Chemistry Graduate School of Engineering Kyoto University

P16) Analysis of Microphase-Separated Structure in Polystyrene-block-Polyvinylpyrrolidone
Naotaka Suenaga[1], Kuniaki Matsuda[1], Go Sakaguchi[1], Kenji Saijo[1], Mikihito Takenaka[1], Hirokazu Hasegawa[1], Yukie Kitada[2], Yasuyuki Nakamura[2], Shigeru Yamago[2]
[1] Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University
[2] Institute for Chemical Research, Kyoto University

P17) Distribution of Glass Transition Temperature in Polymer Thin Film as Studied by Neutron Reflectivity
Rintaro Inoue[1], Toshiji Kanaya[1], Koji Nishida[1], Go Matsuba[2], Masahiro Hino[3]
[1] Institute for Chemical Research, Kyoto University
[2] Faculty of science and Engineering, Yamagata University
[3] Research Reactor Institute, Kyoto University

P18) Hybridization of Through-Space Conjugated Polymers in the Silica Matrix
Yuichi Tsuji, Yasuhiro Morisaki, Yoshiki Chujo
Graduate School of Engineering, Kyoto University

P19) Synthesis of Novel Conjugated Polymers Having Dithienobenzocarborane Units in the Main Chain
Masato Tominaga, Yasuhiro Morisaki, Yoshiki Chujo
Department of Polymer Chemistry, Kyoto University

P20) Study of Stretch-Induced Density Fluctuation of Glassy Polymer

Ryuta Izumi[1], Hirokazu Hasegawa[1], Mikihito Takenaka[1], Shinya Yoshioka[2], Syotaro Nishitsuji[3]
[1] Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University
[2] Department of Mechanical Engineering, Graduate School of Engineering, Osaka City University
[3] Department of functional polymer Chemistry, Graduate School of Engineering, Yamagata University

P21) Investigation of Formation Behavior and Nanostructure of Polymer Brush in a Monolayer of Amphiphilic Diblock Copolymer Containing Betaine on the Water
Yuta Yamakawa[1], Arjun Ghosh[1], Hideki Matsuoka[1], Shin-ichi Yusa[2], Yoshiyuki Saruwatari[3], Hideki Matsuoka[1]
[1] Graduate School of Engineering, Kyoto University
[2] Graduate School of Engineering, University of Hyogo
[3] Osaka Organic Chemical Industries Ltd.

P22) The Effect of Dielectric Constant on Non-Surface Activity and Micellization of Ionic Amphiphilic Diblock Copolymers
Masahiro Hachisuka[1], Tomoyuki Ohnishi[1], Arjun Ghosh[1], Yoshiyuki Saruwatari[2], Hideki Matsuoka[1]
[1] Graduate School of Engineering, Kyoto University
[2] Osaka Organic Chemical Industries Ltd.

P23) Preparation of Cell Aggregates Containing Gelatin Microspheres with Different Degradabilities
Shuhei Tajima, Yasuhiko Tabata
Department of Biomaterials, Institute for Frontier Medical Sciences, Kyoto University

P24) Stretching-Induced Polydomain-Monodomain Transition of Liquid Crystal Elastomers
Haruko Higaki, Kenji Urayama, Toshikazu Takigawa
Department of Material Chemistry, Kyoto University

P25) Biaxial Deformation of End-Linked Poly(propylene oxide) Elastomers
Lee JungJu, Kenji Urayama, Toshikazu Takigawa
Department of Material Chemistry, Kyoto University

P26) Rheological Properties of Colloid Crystals of Soft Gel Particles
Taku Saeki[1], Kenji Urayama[1], Toshikazu Takigawa[1], Daisuke Suzuki[2]
[1] Department of Material Chemistry, Kyoto University
[2] IYREC, Shinsyu University

P27) Rheological Properties of Concentrated Solutions of Agarose in an Ionic Liquid
Ryosuke Yasuda, Jun-ichi Horinaka, Toshikazu Takigawa
Department of Material Chemistry, Kyoto University

P28) Morphological Study of Triblock Terpolymer Melts by 3D-SAXS
Takashi Chijiwa[1], Satoshi Akasaka[1], Nikos Hadjichristidis[2], Hirokazu Hasegawa[1], Mikihito Takenaka[1]
[1] Graduate School of Engineering, Kyoto University
[2] University of Athens, GREECE

P29) Reentrant Volume Phase Transition of Cross-Linked Poly(N-isopropylacrylamide) Gels in Mixed Hydrogen-Bonding Solvents

Hiroyuki Kojima, Tsuyoshi Koga, Fumihiko Tanaka
Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University

P30) Supramolecular Strucuture and Dynamics of Hydrogen-Bonding Organic Gelators
Kotaro Takahashi, Tsuyoshi Koga, Fumihiko Tanaka
Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University

P31) Multilayer Hydration and Molecular Origin of Cooperativity in Aqueous Solutions of Temperature-Sensitive Polymers
Asako Matsuo, Tsuyoshi Koga, Fumihiko Tanaka
Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University

P32) Molecular Simulation of Fracture and Healing for Self-healing Rubbers
Keishi Suzumura, Tsuyoshi Koga, Fumihiko Tanaka
Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University

P33) Crystallization of Isotactic Polypropylene from Mesomorphic Phase: a Constant Heating Rate Study
Koji Nishida[1], Harutoshi Asakawa[1], Go Matsuba[2], Toshiji Kanaya[1], Hiroki Ogawa[3]
[1] Institute for Chemical Research, Kyoto University
[2] Faculty of science and Engineering, Yamagata University
[3] Japan Synchrotron Radiation Research Institute (JASRI)

P34) Fabrication of Phosphatase-Responsive Hydrogels from a Phosphate Group-Containing Methacrylate
Hiroyuki Toda, Masaya Yamamoto, Yasuhiko Tabata
Field of Tissue Engineering, Department of Biomaterials, Institute for Frontier Medical Sciences, Kyoto University

P35) Preparation of Gelatin Hydrogels Containing Nano-Complexes of siRNA and Cationized Gelatin
Takashi Saito, Yasuhiko Tabata
Department of Biomaterials, Institute for Frontier Medical Sciences, Kyoto University

P36) What are Charge Carriers in Polymer/Fullerene Solar Cells? –Spectroscopic Demonstration of Fullerene Cation Formation
Shunsuke Yamamoto[1], Hideo Ohkita[1,2], Hiroaki Benten[1], Shinzaburo Ito[1]
[1] Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University
[2] PRESTO, Japan Science Technology Agency (JST)

P37) Supramolecular Block Copolymers via Living Radical Polymerization: Design of Complementary Hydrogen-Bonded Bifunctional Initiators
Sang Ho Lee, Makoto Ouchi, Mitsuo Sawamoto
Graduate School of Engineering, Kyoto University

P38) Design of Template Monomers and the Precision Radical Polymerizations toward Sequence Regulation
Yusuke Hibi, Makoto Ouchi, Mitsuo Sawamoto
Graduate School of Engineering, Kyoto University

P39) Design of Selective Functional Space with Fluorous Microgel-Core Star Polymers

Yuta Koda, Takaya Terashima, Mitsuo Sawamoto
Graduate School of Engineering, Kyoto University

P40) Solid-State NMR Analysis of Molecular Orientations in Poly(9,9-di-*n*-octyl-2,7-fluorene) Cast Films
Masashi Fukuchi, Tatsuya Fukushima, Atsushi Goto, Hironori Kaji
Institute for Chemical Research, Kyoto University

P41) Living Radical Polymerizations with Non-Transition-Metal Catalysts
Haruki Ohfuji, Atsushi Goto, Hironori Kaji, Yoshinobu Tsujii
Institute for Chemical Research, Kyoto University

P42) Synthesis of Poly(isoprene) by Organoheteroatom-Mediated Living Radical Polymerization and Its Radical Coupling Reaction
Yasuyuki Nakamura, Sora Tomita, Shigeru Yamago
Institute for Chemical Research, Kyoto University

P43) Semisoft Colloidal Crystals Fabricated in Ionic Liquid
Yun Huang, Kohji Ohno, Yoshinobu Tsujii
Institute for Chemical Research, Kyoto University

P44) Development of Super-Resolution Optical Microscopy and Its Application to Structural Analysis of Single Polymer Chain
Hiroyuki Aoki[1,2], Kazuki Mori[1], Shinzaburo Ito[1,2]
[1] Adv. Biomed. Eng. Res. Unit, Kyoto Univ.
[2] Dept. of Polym. Chem., Kyoto Univ.

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