

Poster Session

- June 3rd (MON)
- 19:30 – 20:15 → ODD numbers
 - 20:15 – 21:00 → EVEN numbers

No.	Title, Authors, & Affiliations
P01	Interfacial orientation change of partially fluorinated polymer investigated by heterodyne-detected vibrational sum frequency generation spectroscopy <u>O. Homma</u> ¹ , T. Miyajima ¹ , R. Koguchi ¹ , M. Okuno ² , T. Ishibashi ² ¹ AGC Inc., Japan; ² University of Tsukuba, Japan
P02	Determination of Short Chain Branching (SCB) in Ultra High Molecular Weight Polyethylene (UHMWPE) via FTIR <u>T. Langstraat</u> ¹ , P. Garg ¹ , J. de Heer ¹ , C. Melian ¹ , J. Overdijk ² , P. Tummers ² ¹ SABIC, ² DSM
P03	Stability of non-ionic surfactants in cream products <u>H. Shimada</u> ¹ and H. Sato ² ¹ Shiseido Global Innovation Center, 1-2-11 Takashima, Nishi-ku, Yokohama, Japan. ² National Institute of Advanced Industrial Science and Technology (AIST), 1-1-1 Higashi, Tsukuba, Japan
P04	Molecular characterization of high-molecular weight polymers combining their on-plate degradation with a Kendrick mass defect (KMD) analysis <u>Sayaka Nakamura</u> , Thierry Fouquet, Hiroaki Sato Research Institute for Sustainable Chemistry, National Institute of Advanced Industrial Science and Technology (AIST), 1-1-1 Higashi, Tsukuba, Ibaraki 305-8565, Japan
P05	NMR Study of Star Block Copolypeptide Hydrogel: Influence of Block Size on Chain Dynamics and Water Diffusion <u>B. Wu</u> ^{1,2} , D. Hermida-Merino ¹ , A. Heise ² ¹ Department of Pharmaceutical and Medicinal Chemistry, Royal College of Surgeons in Ireland, 123 St. Stephens Green, Dublin 2, Ireland; ² Dutch-Belgian Beamline (DUBBLE), ESRF - The European Synchrotron Radiation Facility, CS 40220, 38043 Grenoble Cedex 9, France
P06	Effect of Chain Conformation on Forced-Induced Melting in Polymer Single Crystals <u>Ziwen Ma</u> ¹ , Yu Song ^{1,2} , Wenke Zhang ¹ ¹ State Key Laboratory of Supramolecular Structure and Materials, College of Chemistry, Jilin University, ² Institute of Theoretical Chemistry, Jilin University, Changchun, P. R. China.
P07	Chemical Structure Analysis of Organic Materials for Ceramics Using Mass Spectrometry <u>K. Kaneda</u> , M. Sato, S. Nakanishi, H. Seki KYOCERA Co. Analysis Center

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P08	A mass spectrometry imaging method for visualizing synthetic polymers by using average molecular weight and polydispersity as indices. <u>T. Satoh</u> ¹ , S. Nakamura ² , T. Fouquet ² , H. Sato ² , Y. Ueda ¹ <i>¹JEOL Ltd, ²National Institute of Advanced Industrial Science and Technology</i>
P09	Evolution profiles of oligomers formed during heating process of thermal desorption/pyrolysis-DART-MS measurements <u>Hiroaki Sato</u> ¹ , Sayaka Nakamura ¹ , Chikako Takei ² , Ken-ichi Yoshizawa ² <i>National Institute of Advanced Industrial Science and Technology, AIST¹, BioChromato, inc.²</i>
P10	Dynamic nanofishing of single polymer chains using atomic force microscope <u>K Shiomi</u> , X Liang, K Nakajima <i>Department of Chemical Science and Engineering, Tokyo Institute of Technology, Japan</i>
P11	Nano-palpation AFM Application of Investigation on Thermoplastic Vulcanizates Materials <u>M.E. Gunawan</u> , X. Liang, and K. Nakajima <i>Department of Chemical Science and Engineering Tokyo Institute of Technology, Japan</i>
P12	AFM Nanomechanics on Fibrous Filler-Reinforced Rubber Composite under Uniaxial Stretching <u>M. Ito</u> ¹ , Y. Okinaga ¹ , X. Liang ¹ , T. Noguchi ² , K. Nakajima ¹ <i>¹Tokyo Institute of Technology, Japan; ²Shinsyu University, Japan</i>
P13	Morphological Characterization of Polymer Membranes Using Transmission Electron Microscopy, Scanning Electron Microscopy, Scanning Force Microscopy, and Optical Microscopy <u>Clarissa Abetz</u> ¹ , Md. Mushfequr Rahman ¹ , Jiali Wang ¹ , Zhenzhen Zhang ¹ , Volker Abetz ^{1,2} <i>¹Helmholtz-Zentrum Geesthacht, Institute of Polymer Research, Max-Planck-Str. 1, 21502 Geesthacht, Germany; ²University of Hamburg, Institute of Physical Chemistry, Grindelallee 117, 20146 Hamburg, Germany</i>
P14	Frequency dependence of rubber viscoelastic properties investigated by atomic force microscope nanomechanics <u>K. Sekine</u> , M. Ito, X. Liang, K. Nakajima <i>Department of Chemical Science and Engineering, Tokyo Institute of Technology, Japan</i>
P15	LDI-MS imaging of stabilizers in polymer materials using Desorption Ionization Using Through Hole Alumina MEmbrane (DIUTHAME) <u>T. Ohta</u> ¹ , S. Kitagawa ¹ , Y. Iiguni ¹ , H. Ohtani ¹ , M. Kotani ² <i>¹Department of Life Science and Applied Chemistry, Graduate School of Engineering, Nagoya Institute of Technology, Nagoya 466-8555, Japan; ²Hamamatsu Photonics, Iwata, Shizuoka 438-0193</i>

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P16	Polyimide film characterization with chemical and physical analysis <u>Nobutake Sato</u> ¹ , Toshifumi Miyawaki ¹ , Erica Oh ² , Alex Moon ² , Yasuo Asami ³ <i>¹Nihon Waters K.K., ²Waters Korea LTD, ³TA Instruments Japan Inc.</i>
P17	The cryogenic transmission electron microscopy for structural observation of ionomer in catalyst ink for polymer electrolyte fuel cell <u>H. Sugimori</u> ¹ , T. Terao ¹ , M. Koga ² , H. Matsumoto ² , S. Uemura ² , T. Sasabe ² and S. Hirai ² <i>¹FC-Cubic Technology Research Association, 2-3-26 Aomi, Koto-ku, Tokyo, Japan; ²Tokyo Institute of Technology, 2-12-1 Ookayama, Meguro-ku, Tokyo, Japan</i>
P18	Fracture Process in Silica-dispersed Rubber studied by Transmission Electron Microscopy <u>T. Nagao</u> , T. Miyata, H. Jinnai <i>IMRAM, Tohoku Univ., Japan</i>
P19	New Ultra-microtome for SEM array tomography <u>Ayumi Ishihara</u> , Yoshiko Ito <i>Leica Microsystems K.K.</i>
P20	Fracture and Degradation Behaviors of Adhesive Interfaces between Brass and Sulfur-containing Rubber Studied by Transmission Electron Microscopy <u>Katsunori Shimizu</u> , Tomohiro Miyata ¹ , Tomohiko Nagao ¹ , Akemi Kumagai ¹ , Hiroshi Jinnai ¹ <i>The Yokohama Rubber Co., Ltd; ¹Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan</i>
P21	Visualization of matrix-filler interaction of polypropylene composite containing silica particles by two-dimensional disrelation mapping <u>R. Watanabe</u> , A. Sugahara, H. Hagihara, H. Sato, J. Mizukado and H. Shinzawa <i>Research Institute for Sustainable Chemistry, National Institute of Advanced Industrial Science and Technology (AIST), Central 5, 1-1-1 Higashi, 305-8565, Tsukuba, JAPAN</i>
P22	Adsorption states of polymer chains on nanoparticles: atomic-scale observation with electron microscopy <u>T. Miyata</u> , H. Jinnai <i>Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan</i>
P23	AFM analysis of nanomechanical properties of Nafion electrolyte membrane used in fuel cell <u>S. Kuroda</u> ¹ , M. Yamaguchi ¹ , Y. Matsuda ¹ , K. Inokuma ¹ , T. Matsuura ² <i>¹Fuel cell cutting-edge research center (FC-Cubic), TRA, 2-3-26 Aomi, Koto-ku, Tokyo Japan; ²Department of Materials & Life Science, Sophia University, 7-1 Kioicho, Chiyoda-ku, Tokyo, Japan</i>

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No.	Title, Authors, & Affiliations
P24	<p>Effect of temperature on mesoscopic deformation of thermoplastic elastomer under elongations based on <i>in situ</i> small-angle X-ray scattering</p> <p><u>N. Dechnarong</u>¹, K. Kamitani², C.H. Cheng¹, S. Masuda¹, S. Nozaki¹, C. Nagano¹, K. Kojio^{1,2,3}, A. Takahara^{1,2,3}</p> <p>¹Graduate School of Engineering ²Institute for Materials Chemistry and Engineering ³International Institute for Carbon-Neutral Energy Research (WPI-I²CNER), Kyushu University</p>
P25	<p>Dynamic Behaviour of Block Copolymer-Grafted Silica Particles Based-on X-ray Photon Correlation Spectroscopy</p> <p>Chao-Hung Cheng¹, Shiori Masuda¹, Nattanee Dechnarong¹, Kento Fukada¹, Kiyu Uno¹, Kazutaka Kamitani², Taiki Hoshino⁴, Ken Kojio^{1,2,3}, and Atsushi Takahara^{1,2,3}</p> <p>¹Graduate School of Engineering, ²IMCE, ³WPI-I²CNER, Kyushu University, ⁴RIKEN SPring-8 Center</p>
P26	<p>Study of thermal oxidative degradation on polypropylene surface using soft synchrotron radiation</p> <p>Y. Kitada¹, T. Toyoda¹, M. Miura¹, Y. Yoshikawa¹, H. Sato², J. Mizukado², H. Hagihara²</p> <p>¹YAZAKI Corporation, ²National Institute of Advanced Industrial Science and Technology (AIST)</p>
P27	<p>Multi-scale study of the impact of fluoroelastomer addition on the PVDF structure by coupled <i>in situ</i> measurements</p> <p>Sarah Saïdi^{1,2}, Daniel Hermida-Merino², David Chapron¹, Jean Guilment³, Stéphane Bizet³, François Bargain³, Marc Ponçot⁴, Isabelle Royaud⁴, Giuseppe Portale⁵, Patrice Bourson¹</p> <p>¹LMOPS, Université de Lorraine, Centrale Supélec, EA 4423, 2 rue Edouard Belin, Metz, 57070, France; ²Netherlands Organization for Scientific Research (NWO), DUBBLE@ESRF, CS 40220, 38043 Grenoble Cedex 9, France; ³Arkema, Cerdato, 27470, Serquigny, France; ⁴IJL, UMR 7198, CNRS-Université de Lorraine, Département de Science et Ingénierie des Matériaux et Métallurgie, Parc de Saurupt CS 50840, 54011, Nancy, France; ⁵Macromolecular Chemistry & New Polymeric Materials, Zernike Institute for Advanced Materials, University of Groningen, Nijenborgh 4, 9747 AG Groningen, The Netherlands</p>
P28	<p>Application of HT 2D-LC: To study the correlation of CCD x MMD in high impact polypropylene (hi-PP) and modified hi-PP</p> <p>Sampat Singh Bhati, Gerd Lohse, Marcelo Farah, Ana Azeredo, Antonio Carlos Quental Braskem</p>
P29	<p>Development of an integrated qualitative analysis coupled with EI and soft ionization data for GC-HRTOFMS system</p> <p>M. Ubukata, A. Kubo, K. Nagatomo, T. Satoh, <u>J. Tamura</u> JEOL Ltd.</p>
P30	<p>ANALYSIS OF ADDITIVES IN ADHESIVE BY PY-GCxGC-TOFMS</p> <p><u>Asami Matsukami</u>¹, Fumie Kabashima¹, Michiko Kanai¹</p> <p>¹LECO Japan</p>

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P31	Identification of unknown pyrolyzates on pyrograms of polymeric materials obtained by pyrolysis-quadrupole GC/MS using mass spectrometry calibration and analysis software <u>A. Hosaka</u> , S. Kagami, S. Nakamura <i>Agilent Technologies Ltd.</i>
P32	Reaction mechanism of tetraethyl orthosilicate as a model of silane coupling agent studied by analytical pyrolysis techniques and high-resolution MALDI-MS <u>E. Sakamoto</u> , H. Ohtani <i>Department of Life Science and Applied Chemistry, Graduate School of Engineering Nagoya Institute of Technology, Nagoya 466-8555, Japan</i>
P33	Simple identification of ink of ink jet printer by thermal separation probe GC/TCD <u>S. Nakamura</u> , S. Kagami, A. Hosaka <i>Agilent Technologies Ltd.</i>
P34	Molecular weight distribution of living species in polystyrene prepared by reversible addition and fragmentation chain transfer polymerization <u>Taihyun Chang</u> , Kyoungcho Kim ¹ , Junyoung Ahn, Mirim Park ¹ , Heung Bae Jeon ² , Hyun-jong Paik ¹ <i>Department of Chemistry and Division of Advanced Materials Science, Pohang University of Science and Technology (POSTECH), Pohang, 37673, Korea; ¹Department of Polymer Science and Engineering, Pusan National University, Busan, 46241, Korea; ²Department of Chemistry, Kwangwoon University, 20, Gwangun-ro, Nowon-gu, Seoul, 139-701, Korea</i>
P35	Characterization of chain ends structure in polymer materials using pyrolysis-gas chromatography-atmospheric pressure chemical ionization quadrupole time-of-flight mass spectrometry (Py-APGC-MS) <u>K. Harata</u> ¹ , H. Ohtani ¹ , S. Kitagawa ¹ , Y. Iiguni ¹ , T. Ezaki ² <i>¹Department of Life Science and Applied Chemistry, Graduate School of Engineering, Nagoya Institute of Technology, Nagoya 466-8555, Japan; ²Nihon Waters K.K., Tokyo 140-0001, Japan</i>
P36	Detection and Identification of Unknown deterioration products of Acrylic Resin by Using High-Resolution GC-TOFMS <u>F. Kabashima</u> ¹ , A. Matsukami ¹ , M. Kanai ¹ , S. Okamoto ² , T. Honda ² <i>¹LECO Japan, Minato-ku, Tokyo, Japan; ²Meiji Univ., 1-1 Kanda-Surugadai, Chiyoda-ku, Tokyo, Japan</i>
P37	Comparative analysis of automotive coatings using a temperature programmable furnace-type pyrolyzer <u>A. Shiono</u> ¹ , A. Watanabe ¹ , N. Teramae ^{1,2} , H. Ohtani ³ <i>¹Frontier Laboratories Ltd., Saikon, Koriyama, Fukushima, 963-8862, Japan; ²Tohoku Univ., Aoba-ku, Sendai, Miyagi 980-8578, Japan; ³Nagoya Institute of Technology, Showa-ku, Nagoya, Aichi 466-8555, Japan</i>

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P38	Establishing analysis workflow for OFF-Flavor candidate compounds from polymer material by using SPME-GC/MS <u>S. Kagami</u> , A. Hosaka, K. Nohara, S. Nakamura <i>Agilent Technologies Japan Ltd.</i>
P39	Thermal degradation reaction of 4-vinylpyridine-divinylbenzene copolymer in acetic acid studied by pyrolysis-GC-MS and MALDI-MS <u>Y. Ogawa</u> ¹ , H. Ohtani ¹ , K. Urasaki ² , R. Kanai ² ¹ <i>Department of Life Science and Applied Chemistry, Graduate School of Engineering, Nagoya Institute of Technology, Nagoya 466-8555, Japan;</i> ² <i>Chiyoda Corporation, Yokohama 221-0022, Japan</i>
P40	Failure Analysis of PVA Products by Heart-cutting EGA-GC/MS - Difference between Standard and Turbid Products <u>A. Watanabe</u> ¹ , A. Shiono ¹ , N. Teramae ^{1,2} , H. Ohtani ³ ¹ <i>Frontier Laboratories Ltd., Saikon, Koriyama, Fukushima, 963-8862, Japan;</i> ² <i>Tohoku University, Aoba-ku, Sendai, Miyagi, 980-8578, Japan;</i> ³ <i>Nagoya Institute of Technology, Showa-ku, Nagoya, Aichi, 466-8555, Japan</i>
P41	Investigation of a catalytic effect of carbon allotropic surface on pyrolysis behavior of polymers <u>Y. Nagai</u> , Y. Kamiya ¹ , T. Honda ² <i>Graduate School of Science and Technology, Meiji Univ.;</i> <i>Center for Cultural Resource Studies, Institute of Human and Social Sciences, Kanazawa Univ.;</i> <i>School of Science and Technology, Meiji Univ.</i>
P42	Synthesis and advanced structure elucidation of polyesters and development of aqueous polyester dispersions <u>K. Saller</u> , C. Schwarzingler <i>Institute for Chemical Technology of Organic Materials, Johannes Kepler University Linz, Austria</i>
P43	Developed the Sealed pipe pyrolysis recovery method <u>Kensho Miyamoto</u> , Yoshitaka Nagai, Takayuki Honda ¹ <i>Graduate School of Science and Technology of Meiji Univ.;</i> ¹ <i>School of Science and Technology of Meiji Univ.</i>
P44	Structural analysis after UV degradation test of Binder17 used in conservation and restoration of Japanese archaeological remains <u>Yurino Watanabe</u> , Takayuki Honda ¹ <i>Graduate school of Science and Technology, Meiji Univ.;</i> ¹ <i>School of Science and Technology, Meiji Univ.</i>
P45	Preparation and Characterization of Stereocomplex thin film interfacial toughness enhancement by Silane agent <u>Jieun Jeong</u> ¹ , Young Jun Kim

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P46	Interfacial Energy Analysis for Dynamic Polymer Brush <u>M. Saito</u> ¹ , N. L. Yamada ² , K. Ito ¹ , H. Yokoyama ¹ ¹ Graduate School of Frontier Science, the University of Tokyo; ² Neutron Science Division, High Energy Accelerator Research Organization
P47	Analysis of photo-curable resin derived from Cashew Nut Shell <u>Ryotaro Hata</u> , Takayuki Honda ¹ Graduate school of Science and Technology, Meiji univ.; ¹ School of Science and Technology, Meiji univ.
P48	Degraded structure of the matrix of CFRTP exposed to hot steam studied by SEM, GPC, DSC, and positron annihilation lifetime spectroscopy <u>H. Hagihara</u> , R. Watanabe, T. Shimada, M. Funabashi, M. Kunioka, H. Sato Research Institute for Sustainable Chemistry, National Institute of Advanced Industrial Science and Technology [AIST], Central 5, 1-1-1 Higashi, 305-8565, Tsukuba, JAPAN
P49	Analysis on inclusion process of terminal modified polyethylene glycol and cyclodextrin <u>S. Kitawaki</u> ¹ , N. L. Yamada ² , K. Ito ¹ , H. Yokoyama ¹ ¹ Graduate School of Frontier Science, the University of Tokyo; ² Neutron Science Division, High Energy Accelerator Research Organization
P50	Nanoscale Crystal Twinning in Confined Polyamide Nanorods <u>Shichen Yu</u> , ¹ Ziwei Lai, ¹ Hiroshi Jinnai, ² Nan Zheng, ³ Shuailin Zhang, ⁴ Xingming Zeng, ¹ Masaki Ageishi, ² Bernard Lotz, ⁵ Stephen Z. D. Cheng, ^{4,6} Yan Cao ¹ ¹ Institute for Advanced Study, Shenzhen University, Guangdong 518060, China; ² Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai 980-8577, Japan; ³ Institut Charles Sadron, 6, rue Boussingault, 67083 Strasbourg, France; ⁴ Advanced Institute for Soft Matter Science and Technology, South China University of Technology, Guangdong 510640, China; ⁵ Department of polymer science, The University of Akron, Akron, OH, 44325, United States; ⁶ State Key Lab of Luminescent Materials and Devices, South China University of Technology, Guangdong, 513060.
P51	Unique Molecular Order in Polyvinylidene Fluoride under Cylindrical Confinement <u>Xingming Zeng</u> ¹ , Nan Zheng ² , Yan Cao ¹ ¹ Institute for Advanced Study, Shenzhen University, Guangdong 518060, China; ² State Key lab of Luminescent Materials and Devices, South China University of Technology, Guangdong 513060, China

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P52	<p>Hierarchical Structural Balance in Confined Polymer Nanomaterials <u>Ziwei Lai</u>¹, Shuailin Zhang², Hiroshi Jinnai³, Masaki Ageishi³, Bernard Lotz⁴, Yan Cao¹, Stephen Z. D. Cheng^{2,5} <i>¹Institute for Advanced Study, Shenzhen University, Guangdong 518060, China; ²Department of polymer science, The University of Akron, Akron, OH 44325, United States; ³Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Sendai 980-8577, Japan; ⁴Institut Charles Sadron (CNRS - ULP), 6, rue Boussingault, 67083 Strasbourg, France; ⁵South China Advanced Institute for Soft Matter Science and Technology (AISMST), South China University of Technology, Guangdong 510640, China</i></p>
P53	<p>Melting Point Depression and Molecular Order of Polyethylene Terephthalate under Cylindrical Confinement <u>Jiaman Huang</u>¹, Ziwei Lai¹, Hiroshi Jinnai², Masaki Ageishi², Sichen Yu¹, Yan Cao¹ <i>¹Institute for Advanced Study, Shenzhen Univ., Guangdong 518060, China; ²Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku Univ., Sendai 980-8577, Japan</i></p>
P54	<p>37° Bilateral Crystal Branching in poly(4-methyl-1-pentene): A Demonstration of 2D Confinement Impact on Tetragonal Symmetry <u>Ziyang Liang</u>¹, Nan Zheng², Shuailin Zhang³, Bernard Lotz⁴, Yan Cao,¹ <i>¹Institute for Advanced Study, Shenzhen University, Guangdong 518060, China; ²State Key lab of Luminescent Materials and Devices, South China University of Technology, Guangdong 513060, China; ³Department of Polymer Science, The University of Akron, Akron, OH, 44325, USA; ⁴Institut Charles Sadron (CNRS - ULP), 6, rue Boussingault, 67083 Strasbourg, France</i></p>
P55	<p>Evaluation of Thermal Oxidative Degradation on Polypropylene using Chemiluminescence Method <u>M. Miura</u>¹, Y. Kitada¹, S. Yamane², H. Hagihara², H. Sato², J. Mizukado² <i>¹YAZAKI Corporation, ²National Institute of Advanced Industrial Science and Technology (AIST)</i></p>
P56	<p>Analysis of co-monomer of tackifier by MALDI TOF MS and application to hot melt adhesive analysis of diapers <u>Toshiki Nagamachi</u>¹, Masami Kanamaru², Takumi Sugiuchi², Hiroaki Sato³ <i>¹Advanced Technology Research Laboratory, Idemitsu Kosan Co., Ltd.; ²Performance Materials Laboratories, Idemitsu Kosan Co., Ltd.; ³Advanced Industrial Science and Technology (AIST)</i></p>
P57	<p>Evaluation of Biobased Polymers for Packaging Applications <u>H. N. Cheng</u>¹ and Atanu Biswas² <i>¹USDA Agricultural Research Service, Southern Regional Research Center, New Orleans, LA 70124, USA; ²USDA Agricultural Research Service, National Ctr. for Agric. Utilization Research, Peoria, IL 61604, USA</i></p>

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P58	<p>Direct Determination of Biologically Extracted Polyhydroxyalkanoates by Thermally Assisted Hydrolysis and Methylation-Gas Chromatography <u>Lydia Mohamad</u>¹, Khok Yong Sen¹, Fitree Dina², Hadura Abu Hasan², Sudesh Kumar², Yasuyuki Ishida³, Siti Baidurah¹ <i>¹School of Industrial Technology, Universiti Sains Malaysia, 11800, Minden, Penang, Malaysia; ²School of Biological Sciences, Universiti Sains Malaysia, 11800, Minden, Penang, Malaysia; ³Department of Biological Chemistry, College of Bioscience and Biotechnology, Chubu University, 1200 Matsumoto-cho, Kasugai 487-8501, Japan</i></p>
P59	<p>Morphological changes induced by photo-aging studied by positron annihilation spectroscopy (PALS) and solvent swelling behavior <u>T. Ishida</u>¹, R. Kitagaki¹, S. Yamane², H. Hagihara² <i>¹Graduate School of Engineering Hokkaido University, ²Research Institute for Sustainable Chemistry, National Institute of Advanced Industrial Science and Technology (AIST)</i></p>