The 20th Annual Meeting of the Japan Society of Sonochemistry &
The International Workshop on Advanced Sonochemistry

November 2 (Wed) – 4 (Fri), 2011

Noyori Conference Hall, Nagoya University,
Nagoya, Japan

Organized by
Japan Society of Sonochemistry (JSS)

Coorganized by
The Acoustical Society of Japan
The Chemical Society of Japan
Division of Chemical Reaction Engineering,
Society of Chemical Engineers Japan
The Electrochemical Society of Japan

Sponsored by
Inoue Foundation for Science, Japan
Division of Chemical Reaction Engineering,
Society of Chemical Engineers Japan
The Japan Society of Sonochemistry
The Murata Science Foundation, Japan
Oral Presentation

November 3 (Thursday)
Chair: Naoya Enomoto (Kyushu University, Japan)
9:40-10:20 Plenary Lecture
S1. Recent research at the Sonochemistry Centre in Coventry UK
    Timothy J. Mason, L. Paniwnyk, E. Joyce, A. Cobley (Coventry University, UK)

Chair: Kazuaki Ninomiya (Kanazawa University, Japan)
10:20-10:40 Invited
S2. One drop solvent microextraction technique with an aid of ultrasound and its application in trace analysis
    Jiye Jin¹, Junki Ono¹, Kaoru Hattori¹, Yoshiyuki Asakura², Keiji Yasuda³ (¹Shinshu University, Japan, ²Honda Electronics Co., Ltd., Japan, ³Nagoya University, Japan)

10:40-11:00 Invited
S3. Formation of NO₂⁻ and NO₃⁻ during acoustic cavitation in air-saturated water
    Kenji Okitsu (Osaka Prefecture University, Japan)

Chair: Hisashi Harada (Meisei University, Japan)
11:00-11:40 Keynote Lecture
S4. A new expansion of the ultrasonic advanced oxidation methodology into synthetic aspects
    Takahide Kimura (Shiga University of Medical Science, Japan)

Chair: Keiji Yasuda (Nagoya University, Japan)
13:20-14:00 Invited
S5. Application of ultrasound in water treatment
    Jeehyeong Khim (Korea University, Korea)

Chair: Shin-ichi Hatanaka (University of Electro-Communications, Japan)
14:00-14:20
S6. Photocatalytic generation of hydrogen using sonoluminescence and sonochemiluminescence
    Leena Dharmarathne, Muthupandian Ashokkumar, Franz Grieser (University of Melbourne, Australia)

14:20-14:40
S7. Sonication-time and impurity effects of sonoluminescence from Na atom in surfactant solutions
    Yuichi Hayashi, Pak-Kon Choi (Meiji University, Japan)

14:40-15:00
S8. Sonoluminescence and sonochemiluminescence in microreactors
    David Fernandez Rivas¹, Thomas Leong², Muthupandian Ashokkumar² Detlef Lohse¹, Han J.G.E. Gardeniers¹ (¹University of Twente, Netherlands, ²University of Melbourne, Australia)
Chair: Larysa Paniwnyk (Coventry University, UK)
17:00-17:20  
S9. Quantification of ultrasonically-induced mechanical effects by polymer degradation  
Khuyen Viet Bao Tran¹, Shinobu Koda¹, Takahide Kimura², Takashi Kondo³ (¹Nagoya University, Japan, ²Shiga University of Medical Science, Japan, ³University of Toyama, Japan)

17:20-17:40  
S10. Studies on the biological and chemical effects of ultrasound: Implications in drug delivery and cancer therapy  
Mariame Hassan, Yukihiro Furusawa, Masami Minemura, Takashi Kondo (University of Toyama, Japan)

17:40-18:00  
S11. A study of acoustic streaming in sonochemical reactor  
Zheng Xu, Keiji Yasuda, Shinobu Koda (Nagoya University, Japan)

18:00-18:20  
S12. The role of cavitation microstreaming in aqueous surfactant solutions on the growth of bubbles by rectified diffusion  
Thomas Leong¹, James Collis¹, Richard Manaseh², Andrew Ooi¹, Muthupandian Ashokkumar¹, Sandra Kentish¹ (¹University of Melbourne, Australia, ²Swinburne University of Technology, Australia)

November 4 (Friday)  
Chair: Kenji Okitsu (Osaka Prefecture University, Japan)  
9:00-9:40 Plenary Lecture  
S13. The optimization of sonochemical reactions - facts and factors  
Muthupandian Ashokkumar (University of Melbourne, Australia)

Chair: Toru Tuziuti (National Institute of Advanced Industrial Science and Technology, Japan)  
9:40-10:00 Invited  
S14. Quantification of ultrasonic atomization amount for different frequencies  
Keiji Yasuda (Nagoya University, Japan)

10:00-10:20 Invited  
S15. Examining the extraction of artemisinin from artemisia annua using ultrasound  
Rhianna Briars, Larysa Paniwnyk (Coventry University, UK)

10:20-10:40 Invited  
S16. Sono/photo synergy effect using TiO2-coated fibers and 2.4 MHz ultrasound  
Naoya Enomoto¹, Toshikazu Miyajima¹, Miki Inada¹, Yumi Tanaka¹, Junichi Hojo¹, Kenichiro Tanaka² (¹Kyushu University, Japan, ²K2R Co., Ltd, Japan)
10:40-11:00 Invited
S17. Relationship between sonoluminescence, radical production and cavitation bubble dynamics
Shin-ichi Hatanaka (University of Electro-Communications, Japan)

Chair: Kyuichi Yasui (National Institute of Advanced Industrial Science and Technology, Japan)
11:00-11:40 Invited
S18. Hydrodynamic and acoustically generated cavitation: Opportunities and limitations
Aniruddha B. Pandit, Parag R. Gogate (University of Mumbai, India)

Chair: Mahito Atobe (Yokohama National University, Japan)
13:20-14:00 Invited
S19. Controllable synthesis of nanomaterials by sonochemical and sonoelectrochemical methods
Jun-Jie Zhu (Nanjing University, China)

Chair: Takaomi Kobayashi (Nagaoka University of Technology, Japan)
14:00-14:20 Invited
S20. Synthesis of LiFePO₄ cathode material for lithium ion battery using sonochemical oxidation method
Hirokazu Okawa¹, Hiroki Watanabe², Mineo Sato² (¹Akita University, Japan, ²Niigata University, Japan)

14:20-14:40 Invited
S21. Sonochemistry for carbon nanotubes
Naoki Komatsu, Takahide Kimura (Shiga University of Medical Science, Japan)

14:40-15:00 Invited
S22. Numerical simulations of aggregation of sonochemically synthesized BaTiO₃ nanocrystals
Kyuichi Yasui, Kazumi Kato (National Institute of Advanced Industrial Science and Technology, Japan)

15:00-15:20 Invited
S23. Electrochemical reaction of water-insoluble organic droplets in aqueous electrolytes using acoustic emulsification
Mahito Atobe¹,², Koji Nakabayashi², Ikari Shintaro², Toshio Fuchigami² (¹Yokohama National University, Japan, ²Tokyo Institute of Technology, Japan)

15:20-15:40 Invited
S24. Continuous production of nanoemulsion using a microfluidic device with ultrasonic vibration
Tsutomu Ono, Takefumi Kanda, Koichi Suzumori, Ken-ichi Ogawara, Kazutaka Higaki (Okayama University, Japan)
Chair: Susumi Nii (Nagoya University, Japan)

16:00-16:20 Invited
S25. Gene regulation and sonotransfection by low-intensity ultrasound resulting in malignant melanoma inhibition
Loreto Jr B Feril1, Katsuro Tachibana1, Kazuki Yamaguchi1, Yurika Ikeda-Dantsuji1, Takeshi Kondo2, Yoshiaki Tabuchi2, Yukihiro Furusawa2, Ichiro Takasaki2 (1Fukuoka University School of Medicine, Japan, 2University of Toyama, Japan)

16:20-16:40 Invited
S26. Effect of sonication on miRNA expressions and its application for gene expression control with ultrasound
Ryohei Ogawa, Akihiro Morii, Akihiko Watanabe, Zheng-Guo Cui, Takashi Kondo (University of Toyama, Japan)

16:40-17:00 Invited
S27. Underwater shock waves, cavitation and their medical applications
S. Hamid R. Hosseini (Kumamoto University, Japan)

17:00-17:20 Invited
Kazuaki Ninomiya1, Shuhei Oshima1, Shiro Sonoke1, Chiaki Ogino2, Shun-ichi Kuroda3, Nobuki Shimizu1 (1Kanazawa University, Japan, 2Kobe University, Japan, 3Nagoya University, Japan)

17:20-17:40 Invited
S29. In vitro dependence of chemical and biological effects low intensity pulsed ultrasound on pulse repetition frequency
Mikhail A. Buldakov1, Mariame A. Hassan2, Qing-Li Zhao2, Nadejda V. Cherdyntseva1, Takeshi Kondo2 (1Tomsk Cancer Research Institute, Russia, 2University of Toyama, Japan)
Poster Presentation

November 3 (Thursday) 15:00-17:00

P1. Effect of applied pressure on the rate of sonolysis
Yuki Hirai, Hisashi Harada (Meisei University, Japan)

P2. Sonochemical syntheses of spherical and hollow spherical nanostructures and their optical properties
Jun Geng\(^\text{1,2}\), Jun-Jie Zhu\(^\text{2}\) (\(^\text{1}\)Jiangsu Institute of Education, China, \(^\text{2}\)Nanjing University)

P3. Direct observation of the diameter distribution of cavitating bubble in SDS surfactant solutions
Shota Deno, Pak-Kon Choi (Meiji University, Japan)

P4. Improvement of oxidation power in sonolysis by nitric acid
Seiji Aoki, Hisashi Harada (Meisei University, Japan)

P5. Plasma generation and chemical reactions by radio-frequency irradiation into water
Shinobu Mukasa, Shinfuku Nomura, Hiromichi Toyota (Ehime University, Japan)

P6. Effects of pressure and temperature on the sonochemical reaction in a flow-type reactor equipped with a PZT transducer
Tatsuya Yotsumoto\(^\text{1}\), Yoshihiro Kojima\(^\text{1}\), Yoshiyuki Asakura\(^\text{2}\), Shinobu Koda\(^\text{1}\) (\(^\text{1}\)Nagoya University, Japan, \(^\text{2}\)Honda Electronics Co. Ltd., Japan)

P7. Reductive coupling of substituted acetophenoaxes with TiCl\(_4\) and Zn under ultrasonication
Yusumoi Takizawa\(^\text{1,2}\), Takekazu Harada\(^\text{1}\), Nobutoshi Yoshihara\(^\text{1}\), Shoichi Ohkouchi\(^\text{3}\) (\(^\text{1}\)Tokyo Gakugei University, Japan, \(^\text{2}\)CSC Research and Development Co., Japan, \(^\text{3}\)Hosei University, Japan)

P8. Effect of ultrasound on acrylic acid-N-hydroxyethylacrylamide copolymers containing hydrogen bond networks
Venegas S.J. Addiel, Takaomi Kobayashi (Nagaoka University of Technology, Japan)

P9. Study of ultrasound effect on hydrogen bonding networks of PVA/PHEMA hydrogels
Kazuki Nakasone, Takaomi Kobayashi (Nagaoka University of Technology, Japan)

P10. Ultrasound effect on morphology change in phase separation of azobenzene amphiphilic block copolymers
Masato Nakaguchi, Takaomi Kobayashi (Nagaoka University of Technology, Japan)

P11. Simple bromination of aromatic compounds by ultrasound
Mitsue Fujita\(^\text{1}\), Jean-Marc Lévéque\(^\text{2}\), Hajime Sohmiya\(^\text{1}\), Naoki Komatsu\(^\text{1}\), Takahide Kimura\(^\text{1}\) (\(^\text{1}\)Shiga University of Medical Science, Japan, \(^\text{2}\)Université de Savoie, Bourget du, France)
P12. Fundamental study on a biomass saccharification process using an ultrasonic wave and a solid acid catalyst
Yuta Tahara, Kazuhiko Sekiguchi, Qingyue Wang (Saitama University, Japan)

P13. Sonochemical degradation of cellulose in N-methyl-morpholine N-oxide / water mixture
Tetsuya Kojima, Miyako Takayasu, Shinobu Koda (Nagoya University, Japan)

P14. Ultrasonic pretreatment in ionic liquids enhanced subsequent enzymatic saccharification of lignocellulosic materials
Kazuki Ninomiya, Kazuki Kamide, Kenji Takahashi, Nobuaki Shimizu (Kanazawa University, Japan)

P15. Enhancement of ultrasonic degradation of methylene blue by simultaneous gas bubbling in the presence of various metal oxides
Osamu Terakado, Ryo Sato, Masahiro Hirasa (Nagoya University, Japan)

P16. Effect of ultrasonic frequency on degradation kinetics rate of methylene blue
Daisuke Kobayashi¹, Chiemi Honma¹, Atsushi Suzuki¹, Tomoki Takahashi¹, Hideyuki Matsumoto², Chiaki Kuroda², Katsuto Otake¹, Atsushi Shono¹ (¹Tokyo University of Science, Japan, ²Tokyo Institute of Technology, Japan)

P17. Arsenic removal from acid mine drainage using jarosite synthesis by ultrasound irradiation
Ryota Hosokawa, Tomohiro Yoshikawa, Hirokazu Okawa (Akita University, Japan)

P18. Ultrasonic degradation of phenol in water in the presence of Fe doped TiO₂
Masaki Kubo, Katsuhiro Akiyama, Toshikuni Yonemoto (Tohoku University, Japan)

P19. Estimation of xenobiotic compound degradability by activated sludge with cavitation
Takakuni Tanaka, Narumi Yoshikawa, Hiroki Saito (Oyama National College of Technology, Japan)

P20. Removal of arsenic from acid aqueous solution
Tomohiro Yoshikawa, Ryota Hosokawa, Hirokazu Okawa (Akita University, Japan)

P21. Enhanced hydroxyl radical generation and cell injury by the combined use of TiO₂ particles and ultrasounds with dual frequencies
Kyohei Noda, Kazuki Ninomiya, Nobuaki Shimizu (Kanazawa University, Japan)

P22. Ultrasound induces DNA double strand breaks in genome DNA through the cavitation effects
Yukihiro Furusawa, Takashi Kondo (University of Toyama, Japan)

P23. Sonodynamic cancer therapy using low-intensity ultrasound with novel porphyrin derivatives
Hirotomo Shibaguchi, Hirofumi Tsuru, Ken Hachimine, Motomu Kuroki, Masahide, Kuroki (Fukuoka University, Japan)
P24. Release of the intra-liposomal content using ultrasound irradiation and heating
Mika Ohata, Koichi Terasaka, Satoko Fujioka (Keio University, Japan)

P25. Surface roughness of the ultrasonic probe dependence of sonolytic hydrolysis of peptides
Motoshi Sakakura, Mitsuo Takayama (Yokohama City University, Japan)

P26. The rate control of sonolysis by introducing CO₂
Mayumi Oda, Takuro Akasaka, Tadanobu Sawada, Hisashi Harada (Meisei University, Japan)

P27. Difference in degradation of polyethylene oxide at 20 kHz sonication with horn and
Langevin transducer
Khuyen Viet Bao Tran¹, Shinobu Koda¹, Yoshiyuki Asakura² (¹Nagoya University, Japan, ²Honda Electronics Co. Ltd., Japan)

P28. Sonolysis of KI solution using 2.4 MHz ultrasonic atomizer
Kyoaki Shinashi¹, Seiji Aoki², Hisashi Harada² (¹Chuogakuin University, Japan, ²Meisei University, Japan)

P29. Effects of reactor materials on ultrasonic degradation efficiency under indirect
irradiation
Yusuke Takeuchi, Koichi Terasaka, Satoko Fujioka (Keio University, Japan)

P30. Preparation of metal loaded TiO₂ photocatalyst under ultrasonic irradiation
Kyoaki Shinashi¹, Tomofumi Tsuji², Hisashi Harada² (¹Chuogakuin University, Japan, ²Meisei University, Japan)

P31. Evolution of ultrasonic medium using coumarin probes
Kosuke Hirano, WeiMin Zhou, Takaomi Kobayashi (Nagaoka University of Technology, Japan)

P32. Separation of aqueous propanol solution with ultrasonic atomization
Sho Yamada¹, Kenji Suzuki¹, Susumu Nii¹, Kazuo Matsuura², Tetsuo Fukazu² (¹Nagoya University, Japan, ²Nono Mist Technologies, Co. Ltd., Japan)

P33. Dust control using ultrasonic atomization
Kentaro Nishi, Dai Shindo, Hirokazu Okawa (Akita University, Japan)

P34. Ultrasonic separation of cations in an aqueous solution
Takuro Akasaka¹, Mayumi Oda¹, Masanori Sato², Hisashi Harada¹ (¹Meisei University, Japan, ²Honda Electronics Co. Ltd., Japan)

P35. Effect of liquid properties on ultrasonic atomization amount
Risa Okura¹, Keiji Yasuda¹, Yoshiyuki Asakura², Shinobu Koda¹ (¹Nagoya University, Japan, ²Honda Electronics Co. Ltd., Japan)
P36. Separation mechanism in separation through ultrasonic atomization explained by strings model
Kazuo Matsuura\textsuperscript{1,2}, Akihiro Wakisaka\textsuperscript{2} (\textsuperscript{1}Nano Mist Technologies Co. Ltd., Japan, \textsuperscript{2}National Institute of Advanced Industrial Science and Technology, Japan)

P37. Antisolvent crystallization of glycine with high frequency ultrasound
Saki Takayanagi, Susumu Nii (Nagoya University, Japan)

P38. Effects of ultrasonic irradiation on cooling crystallization process of L-asparaginic acid
Tatsumi Yamamoto, Shin-ichiro Morimoto, Takuji Eryu, Hiroyuki Kawasaki, Hidetoshi Mori (University of Toyama, Japan)

P39. Synthesis of hydroxyapatite with high specific surface area by ultrasound irradiation
Kana Kitazawa, Tetsuo Umegaki, Yoshiyuki Kojima (Nihon University, Japan)

P40. Spontaneous formation of gold nanoparticles from tetrachloride gold(III) ions in sonicated water
Shoichi Miwa, Tomohiko Okada, Shozzi Mishima, Toshio Sakai (Shinshu University, Japan)

P41. The effects of ultrasound on the synthesis of hydroxyapatite-TiO\textsubscript{2} composites
Daichi Nakai\textsuperscript{1}, Yoshiteru Mizukoshi\textsuperscript{2}, Kenji Okitsu\textsuperscript{1}, Rokuro Nishimura\textsuperscript{1} Naoya Masahashi\textsuperscript{2} (\textsuperscript{1}Osaka Prefecture University, Japan, \textsuperscript{2}Tohoku University, Japan)

P42. Sonochemical synthesis of Pd nanoparticles in the presence of CTAB and NaBr
Satoko Doi, Kenji Okitsu, Rokuro Nishimura (Osaka Prefecture University, Japan)

P43. Dispersion and coalescence of oil droplet under ultrasonic field
Shingo Nakayama\textsuperscript{1}, Keiji Yasuda\textsuperscript{1}, Yoshiyuki Asakura\textsuperscript{2}, Jiye Jin\textsuperscript{3} (\textsuperscript{1}Nagoya University, Japan, \textsuperscript{2}Honda Electronics Co., Ltd., Japan, \textsuperscript{3}Shinshu University, Japan)

P44. Preparation of transparent nano-emulsion using tandem acoustic emulsification and its application to electropolymerization
Koji Nakabayashi\textsuperscript{1}, Kenji Machida\textsuperscript{2}, Sekihiro Takeda\textsuperscript{2}, Kenji Tamamitsu\textsuperscript{2}, Toshio Fuchigami\textsuperscript{1}, Mahito Atobe\textsuperscript{1,3} (\textsuperscript{1}Tokyo Institute of Technology, Japan, \textsuperscript{2}Nippon Chem-Con Co., Japan, \textsuperscript{3}Yokohama National University, Japan)

P45. Enhancement of the phase-transfer catalytic reaction by using tandem acoustic emulsification
Hiroyuki Yanagi\textsuperscript{1}, Koji Nakabayashi\textsuperscript{1}, Toshio Fuchigami\textsuperscript{1}, Mahito Atobe\textsuperscript{1,2} (\textsuperscript{1}Tokyo Institute of Technology, Japan, \textsuperscript{2}Yokohama National University, Japan)

P46. Characterization and analytical applications of gold nanoparticles prepared by sonochemical method
Jiye Jin, Junki Ono, Kiyokazu Kametani (Shinshu University, Japan)
P47. Study on particle size-controlled synthesis of polymer nanoparticles using tandem acoustic emulsification  
Maya Kojima¹, Koji Nakabayashi¹, Toshio Fuchigami¹, Mahito Atobe¹,² (¹Tokyo Institute of Technology, Japan, ²Yokohama National University, Japan)

P48. Effect of ultrasonic power on characteristics of produced polymer particles in separate-type ultrasonic irradiation systems  
Hideyuki Matsumoto, Hiroyuki Mori, Chiaki Kuroda (Tokyo Institute of Technology, Japan)

P49. Effect of pulsing operation on ultrasonic dispersion of inorganic particles in acrylic resin  
Toru Tuziuti, Kyuichi Yasui, Atsuya Towata, Kazumi Kato (National Institute of Advanced Industrial Science and Technology, Japan)