

# **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

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Inoue Foundation for Science, Japan  
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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 Jin<sup>1</sup>, Junki Ono<sup>1</sup>, Kaoru Hattori<sup>1</sup>, Yoshiyuki Asakura<sup>2</sup>, Keiji Yasuda<sup>3</sup> (<sup>1</sup>Shinshu University, Japan, <sup>2</sup>Honda Electronics Co., Ltd., Japan, <sup>3</sup>Nagoya University, Japan)

10:40-11:00 Invited

S3. Formation of NO<sub>2</sub><sup>-</sup> and NO<sub>3</sub><sup>-</sup> 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 Rivas<sup>1</sup>, Thomas Leong<sup>2</sup>, Muthupandian Ashokkumar<sup>2</sup>, Detlef Lohse<sup>1</sup>, Han J.G.E. Gardeniers<sup>1</sup> (<sup>1</sup>University of Twente, Netherlands, <sup>2</sup>University 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 Tran<sup>1</sup>, Shinobu Koda<sup>1</sup>, Takahide Kimura<sup>2</sup>, Takashi Kondo<sup>3</sup> (<sup>1</sup>Nagoya University, Japan, <sup>2</sup>Shiga University of Medical Science, Japan, <sup>3</sup>University 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 Leong<sup>1</sup>, James Collis<sup>1</sup>, Richard Manaseh<sup>2</sup>, Andrew Ooi<sup>1</sup>, Muthupandian Ashokkumar<sup>1</sup>, Sandra Kentish<sup>1</sup>, (<sup>1</sup>University of Melbourne, Australia, <sup>2</sup>Swinburne 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 TiO<sub>2</sub>-coated fibers and 2.4 MHz ultrasound

Naoya Enomoto<sup>1</sup>, Toshikazu Miyajima<sup>1</sup>, Miki Inada<sup>1</sup>, Yumi Tanaka<sup>1</sup>, Junichi Hojo<sup>1</sup>, Kenichiro Tanaka<sup>2</sup> (<sup>1</sup>Kyushu University, Japan, <sup>2</sup>K2R 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  $\text{LiFePO}_4$  cathode material for lithium ion battery using sonochemical oxidation method

Hirokazu Okawa<sup>1</sup>, Hiroki Watanabe<sup>2</sup>, Mineo Sato<sup>2</sup> (<sup>1</sup>Akita University, Japan, <sup>2</sup>Niigata 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  $\text{BaTiO}_3$  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 Atobe<sup>1,2</sup>, Koji Nakabayashi<sup>2</sup>, Ikari Shintaro<sup>2</sup>, Toshio Fuchigami<sup>2</sup> (<sup>1</sup>Yokohama National University, Japan, <sup>2</sup>Tokyo 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 Feril<sup>1</sup>, Katsuro Tachibana<sup>1</sup>, Kazuki Yamaguchi<sup>1</sup>, Yurika Ikeda-Dantsuji<sup>1</sup>, Takeshi Kondo<sup>2</sup>, Yoshiaki Tabauchi<sup>2</sup>, Yukihiro Furusawa<sup>2</sup>, Ichiro Takasaki<sup>2</sup> (<sup>1</sup>Fukuoka University School of Medicine, Japan, <sup>2</sup>University 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

S28. Targeted sonodynamic therapy using protein-modified TiO<sub>2</sub> nanoparticles

Kazuaki Ninomiya<sup>1</sup>, Shuhei Oshima<sup>1</sup>, Shiro Sonoke<sup>1</sup>, Chiaki Ogino<sup>2</sup>, Shun-ichi Kuroda<sup>3</sup>, Nobuaki Shimizu<sup>1</sup> (<sup>1</sup>Kanazawa University, Japan, <sup>2</sup>Kobe University, Japan, <sup>3</sup>Nagoya 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. Buldakov<sup>1</sup>, Mariame A. Hassan<sup>2</sup>, Qing-Li Zhao<sup>2</sup>, Nadejda V. Cherdyntseva<sup>1</sup>, Takeshi Kondo<sup>2</sup> (<sup>1</sup> Tomsk Cancer Research Institute, Russia, <sup>2</sup>University 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<sup>1,2</sup>, Jun-Jie Zhu<sup>2</sup> (<sup>1</sup>Jiangsu Institute of Education, China, <sup>2</sup>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<sup>1</sup>, Yoshihiro Kojima<sup>1</sup>, Yoshiyuki Asakura<sup>2</sup>, Shinobu Koda<sup>1</sup> (<sup>1</sup>Nagoya University, Japan, <sup>2</sup>Honda Electronics Co. Ltd., Japan)

P7. Reductive coupling of substituted acetophenones with TiCl<sub>4</sub> and Zn under ultrasonication

Yasuomi Takizawa<sup>1,2</sup>, Takekazu Harada<sup>1</sup>, Nobutoshi Yoshihara<sup>1</sup>, Shoichi Ohkouchi<sup>3</sup> (<sup>1</sup>Tokyo Gakugei University, Japan, <sup>2</sup>CSC Research and Development Co., Japan, <sup>3</sup>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<sup>1</sup>, Jean-Marc L  v  que<sup>2</sup>, Hajime Sohmiya<sup>1</sup>, Naoki Komatsu<sup>1</sup>, Takahide Kimura<sup>1</sup> (<sup>1</sup>Shiga University of Medical Science, Japan, <sup>2</sup>Universit   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 Hirasawa (Nagoya University, Japan)

P16. Effect of ultrasonic frequency on degradation kinetics rate of methylene blue

Daisuke Kobayashi<sup>1</sup>, Chiemi Honma<sup>1</sup>, Atsushi Suzuki<sup>1</sup>, Tomoki Takahashi<sup>1</sup>, Hideyuki Matsumoto<sup>2</sup>, Chiaki Kuroda<sup>2</sup>, Katsuto Otake<sup>1</sup>, Atsushi Shono<sup>1</sup> (<sup>1</sup>Tokyo University of Science, Japan, <sup>2</sup>Tokyo 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 TiO<sub>2</sub>

Masaki Kubo, Katsuhiko 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 TiO<sub>2</sub> particles and ultrasounds with dual frequencies

Kyohei Noda, Kazuaki 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

Hiroto 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 efficiency  
Motoshi Sakakura, Mitsuo Takayama (Yokohama City University, Japan)

P26. The rate control of sonolysis by introducing CO<sub>2</sub>  
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 BaoTran<sup>1</sup>, Shinobu Koda<sup>1</sup>, Yoshiyuki Asakura<sup>2</sup> (<sup>1</sup>Nagoya University, Japan, <sup>2</sup>Honda Electronics Co. Ltd., Japan)

P28. Sonolysis of KI solution using 2.4 MHz ultrasonic atomizer  
Kiyoaki Shinashi<sup>1</sup>, Seiji Aoki<sup>2</sup>, Hisashi Harada<sup>2</sup> (<sup>1</sup>ChuoGakuin University, Japan, <sup>2</sup>Meisei 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 TiO<sub>2</sub> photocatalyst under ultrasonic irradiation  
Kiyoaki Shinashi<sup>1</sup>, Tomofumi Tsuji<sup>2</sup>, Hisashi Harada<sup>2</sup> (<sup>1</sup>ChuoGakuin University, Japan, <sup>2</sup>Meisei 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 Yamada<sup>1</sup>, Kenji Suzuki<sup>1</sup>, Susumu Nii<sup>1</sup>, Kazuo Matsuura<sup>2</sup>, Tetsuo Fukazu<sup>2</sup> (<sup>1</sup>Nagoya University, Japan, <sup>2</sup>Nono 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 Akasaka<sup>1</sup>, Mayumi Oda<sup>1</sup>, Masanori Sato<sup>2</sup>, Hisashi Harada<sup>1</sup> (<sup>1</sup>Meisei University, Japan, <sup>2</sup>Honda Electronics Co. Ltd., Japan)

P35. Effect of liquid properties on ultrasonic atomization amount  
Risa Okura<sup>1</sup>, Keiji Yasuda<sup>1</sup>, Yoshiyuki Asakura<sup>2</sup>, Shinobu Koda<sup>1</sup> (<sup>1</sup>Nagoya University, Japan, <sup>2</sup>Honda Electronics Co. Ltd., Japan)



P36. Separation mechanism in separation through ultrasonic atomization explained by strings model

Kazuo Matsuura<sup>1,2</sup>, Akihiro Wakisaka<sup>2</sup> (<sup>1</sup>Nano Mist Technologies Co. Ltd., Japan, <sup>2</sup>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, Shozi Mishima, Toshio Sakai (Shinshu University, Japan)

P41. The effects of ultrasound on the synthesis of hydroxyapatite-TiO<sub>2</sub> composites

Daichi Nakai<sup>1</sup>, Yoshiteru Mizukoshi<sup>2</sup>, Kenji Okitsu<sup>1</sup>, Rokuro Nishimura<sup>1</sup>, Naoya Masahashi<sup>2</sup> (<sup>1</sup>Osaka Prefecture University, Japan, <sup>2</sup>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<sup>1</sup>, Keiji Yasuda<sup>1</sup>, Yoshiyuki Asakura<sup>2</sup>, Jiye Jin<sup>3</sup> (<sup>1</sup>Nagoya University, Japan, <sup>2</sup>Honda Electronics Co., Ltd., Japan, <sup>3</sup> Shinshu University, Japan)

P44. Preparation of transparent nano-emulsion using tandem acoustic emulsification and its application to electropolymerization

Koji Nakabayashi<sup>1</sup>, Kenji Machida<sup>2</sup>, Sekihiko Takeda<sup>2</sup>, Kenji Tamamitsu<sup>2</sup>, Toshio Fuchigami<sup>1</sup>, Mahito Atobe<sup>1,3</sup> (<sup>1</sup>Tokyo Institute of Technology, Japan, <sup>2</sup>Nippon Chem-Con Co., Japan, <sup>3</sup>Yokohama National University, Japan)

P45. Enhancement of the phase-transfer catalytic reaction by using tandem acoustic emulsification

Hiroyuki Yanagi<sup>1</sup>, Koji Nakabayashi<sup>1</sup>, Toshio Fuchigami<sup>1</sup>, Mahito Atobe<sup>1,2</sup> (<sup>1</sup>Tokyo Institute of Technology, Japan, <sup>2</sup>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 Kojima<sup>1</sup>, Koji Nakabayashi<sup>1</sup>, Toshio Fuchigami<sup>1</sup>, Mahito Atobe<sup>1,2</sup> (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)