The 12th International Conference on Supercritical Fluids

Supergreen 2022

Program book

October 24-29, 2022

National Taipei University of Technology

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Welcome Address

On behalf of the Organizing Committee and Advisory Committee, we sincerely welcome you to participate in the Supergreen 2022, the 12th International Conference on Supercritical Fluids organized by the Asian Society of Supercritical Fluids (ASSF), the Taiwan Supercritical Fluid Association (TSCFA) and the National Taipei University of Technology (Taipei Tech).

This conference aims to discuss the progress and application of supercritical fluid technologies. The following five topics will be covered during the conference: (1) Physicochemical properties and thermodynamics, (2) Natural products, pharmaceutical, and biomedical applications, (3) Reactions, material design, and nanotechnology, (4) Process intensification, CO_2 utilization, and industrial applications and (5) Special session of applications of SCF technology in Taiwan. There are plenary and invited presentations, as well as oral and poster presentations. The Supergreen conference was originally scheduled to take place in Taiwan in 2021, but the conference was postponed to 2022 due to the COVID-19 pandemic. We believe this is an excellent opportunity to stimulate interactions and pioneering ideas between participants from worldwide areas.

The Supergreen conference was firstly initiated in 2001 by Professor C. M. Wai of the Department of Chemistry, the University of Idaho, USA. Previous conferences had been held in Suwon (Korea, 2002), Nagoya (Japan, 2003), Tianjing (China, 2004), Taipei (Taiwan, 2005), Seoul (Korea, 2007), Sendai (Japan, 2009), Beijing (China, 2011). Kaohsiung (Taiwan, 2013), Seoul (Korea, 2015), Nagoya (Japan, 2017) and Shaanxi (China, 2019). It is our great honor to host the Superrgeen 2022 at the National Taipei University of Technology, located at Taipei in Taiwan.

We greatly appreciate your participation and contribution to this conference. We hope you enjoy the scientific presentations and discussions, and also have a pleasant stay in Taiwan.

Sincerely yours,

Dar-Jen Hsieh
Taiwan Supercritical Fluid Association

Chie-Shaan Su
National Taipei University of Technology

Organizer and Committee

Organizer

Asian Society of Supercritical Fluids (ASSF)
National Science and Technology Council (NSTC)
National Taipei University of Technology (Taipei Tech)
Taiwan Supercritical Fluid Association (TSCFA)

Co-organizer

Acro Biomedical Co., Ltd.
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Yan-Ping Chen (National Taiwan University)
Motonobu Goto (Nagoya University)
Buxing Han (Chinese Academy of Science)
Youn-Woo Lee (Seoul National University)

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Masaru Watanabe (Tohoku University)
Yaping Zhao (Shanghai Jiao Tong University)

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Chieh-Ming Hsieh (National Central University)
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Ming-Tsung Lee (National Taipei University of Technology)
Jin-Shuh Li (Chung Cheng Institute of Technology)
Kuan-Ju Liu (National Penghu University of Science and Technology)
Ardila Hayu Tiwikrama (National Taipei University of Technology)
Hsien-Tsung Wu (Ming Chi University of Technology)
Tsung-Mao Yang (Chung Cheng Institute of Technology)
Shu-Kai Yeh (National Taiwan University of Science and Technology)

Sponsors

Greenyn Biotechnology Co., Ltd.
Linde Lienhwa Industrial Gases Co., Ltd.
Pinature Dental Clinic
Safety and Health Technology Center
Sunway Scientific Corporation
Taiwan Supercritical Technology Co., Ltd.

(Alphabetize by last name)

Topics

(1) Physicochemical properties and thermodynamics
(2) Natural products, pharmaceutical and biomedical applications
(3) Reactions, material design and nanotechnology
(4) Processes intensification, carbon dioxide utilization and industrial applications
(5) Special session: Applications of SCF technology in Taiwan

Way to hold Supergreen 2022

Supergreen 2022 will be held in a hybrid mode. All submitted oral and poster presentations will be shown in an asynchronous platform during the period from 10/24 to 10/27. The pre-recorded video and poster will be collected on this platform for discussion asynchronously. An on-site meeting will be held at the Gis Taipei Tech conference center on 10/ 28 for the plenary and the invited speakers from Taiwan, and Cisco Webex will be used to stream the meeting online. In addition, an on-site poster presentation will also be held at the Gis Taipei Tech convention center on 10/28. The lectures given by the overseas plenary and invited speakers will turn fully online, and an online meeting on 10/29 will be held using Cisco Webex. Please see the following table for the summary of the Supergreen 2022 presentation way.

Type of presenting author	Presentation way	Presentation time
Plenary and invited speaker from Taiwan	On-site and live streamed	10/28
Overseas plenary and invited speaker	Online	10/29
Submitted oral presentation	Asynchronous webinar	10/24-10/27
Submitted poster presentation	Asynchronous webinar	10/24-10/27
	On-site presentation	10/28

Plenary and invited speakers

Plenary speakers

Prof. Tadafumi Adschiri
Institute of Multidisciplinary Research for Advanced Materials
Tohoku University
Chemical reactions in supercritical water and their applications

Prof. Motonobu Goto
Department of Materials Process Engineering
Nagoya University
Supercritical fluid technology for phytochemicals

Prof. Buxing Han
Institute of Chemistry
Chinese Academy of Sciences
Properties of green solvents and their applications in green chemistry

Dr. Dar-Jen Hsieh
ACRO Biomedical Co.
Supercritical CO_2, the ultimate solution for tissue engineering and regenerative medicine

Prof. Youn-Woo Lee
School of Chemical and Biological Engineering and Institute of Chemical Process
Seoul National University
Beyond critical point

Invited speakers

Prof. Cyril Aymonier
Institute of Condensed Matter Chemistry of Bordeaux (ICMCB)
Physico-chemistry in supercritical fluids for a circular economy

Prof. You Han
School of Chemical Engineering and Technology
Tianjin University
ReaxFF force field development and application in supercritical water reaction

Prof. Jaehoon Kim
School of Chemical Engineering
Sungkyunkwan University
Role of sub- and supercritical solvents for biomass conversion

Prof. Željko Knez
University of Maribor
Faculty of Chemistry and Chemical Engineering
Use of high pressure technologies for design of product for pharma industry

Prof. Yusuke Shimoyama
Department of Chemical Science and Engineering
Tokyo Institute of Technology
Pharmaceutical crystal engineering in supercritical CO_2

Prof. Hirohisa Uchida
Faculty of Frontier Engineering
Kanazawa University
Fabrication of high-performance organic thin film transistors by rapid expansion of supercritical solutions (RESS) using CO_2

Prof. Masaru Watanabe
Department of Chemical Engineering
Tohoku University
Recycling of plastics and leaching of LIB cathode elements by hydrothermal technology

Prof. Qun Xu
College of Materials Science and Engineering
Zhengzhou University
Conversion of non-magnetic materials to 2D ferromagnet by CO_2-induced phase engineering

Prof. Tae Jun Yoon
Department of Chemical Engineering and Applied Chemistry
Chungnam National University
Zero-liquid discharge supercritical water desalination: from electrons to molecules to processes

Prof. Huanda Zheng
Liaoning Provincial Key Laboratory of Supercritical CO_2 Waterless Dyeing
Dalian Polytechnic University
Research progress of supercritical CO_2 waterless dyeing and finishing

Speakers for Taiwan special session

Prof. Ping-Shan Lai
Department of Chemistry
National Chung Hsing University
Pharmaceutical applications of supercritical fluid extraction with micro-/nanoparticle formulations

Dr. Ming-Tsai Liang
JOPE Technology Co.
Industrial application of continuous chromatography by using supercritical fluid as eluent for the separation of EPA ethyl ester from fish oil

Prof. Shen-Kung Liao
Department of Fiber and Composite Materials
Feng Chia University
Industrial application of supercritical dyeing in Taiwan

Prof. Chie-Shaan Su
Department of Chemical Engineering and Biotechnology
National Taipei University of Technology
Particle design of anticancer drug using supercritical fluid technology

Prof. Shu-Kai Yeh
Department of Materials Science and Engineering
National Taiwan University of Science and Technology
Advances of polymer nanocellular foam

(Alphabetize by last name)

Scientific Program

2022/10/24-2022/10/27
Asynchronous Webinar **For all submitted oral and poster presentations**

2022/10/28 On-site meeting and live streamed using Cisco Webex For plenary and invited lectures from Taiwan Room: The Lecture Hall	
08:30-14:30	Registration
09:15-09:30	Welcome Ceremony
Session 1: Applications of SCF in Taiwan Chair: Prof. Yan-Ping Chen (National Taiwan University)	
09:30-10:00	**PL-1: Dr. Dar-Jen Hsieh** (ACRO Biomedical Co.) Supercritical CO_2, the ultimate solution for tissue engineering and regenerative medicine
10:00-10:25	**IL-1: Prof. Shen-Kung Liao** (Feng Chia University) Industrial application of supercritical dyeing in Taiwan
10:25-10:45	Short break
Session 2: Applications of SCF in Taiwan Chair: Ming-Jer Lee (National Taiwan University of Science and Technology)	
10:45-11:10	**IL-2: Dr. Ming-Tsai Liang** (JOPE Technology Co.) Industrial application of continuous chromatography by using supercritical fluid as eluent for the separation of EPA ethyl ester from fish oil
11:10-11:35	**IL-3: Prof. Ping-Shan Lai** (National Chung Hsing University) Pharmaceutical applications of supercritical fluid extraction with micro/nanoparticle formulations
11:35-12:00	**IL-4: Prof. Shu-Kai Yeh** (National Taiwan University of Science and Technology) Advances of polymer nanocellular foam

12:00-13:30	Lunch (The Lecture Hall)
13:30-14:30	On-site poster presentation (Room 201)
TSCFA annual member meeting (For TSCFA members only)	
14:30-17:30	TSCFA annual member meeting
18:00-20:00	Banquet

2022/10/29 Online meeting using Cisco Webex For overseas plenary and invited lectures	
Session 3: Reactions, material design and nanotechnology Chair: Prof. Jui-Yang Feng (National University of Kaohsiung)	
09:00-09:30	**PL-2: Prof. Tadafumi Adschiri** (Tohoku University) Chemical reactions in supercritical water and their applications
09:30-09:55	**IL-5: Prof. Jaehoon Kim** (Sungkyunkwan University) Role of sub- and supercritical solvents for biomass conversion
09:55-10:20	**IL-6: Prof. Qun Xu** (Zhengzhou University) Supercritical CO_2-induced phase engineering for room-temperature ferromagnetism materials
10:20-10:45	**IL-7: Prof. Masaru Watanabe** (Tohoku University) Recycling of plastics and leaching of LIB cathode elements by hydrothermal technology
10:45-11:00	Short break
Session 4: Processes intensification, CO_2 utilization and industrial applications Chair: Prof. Hsien-Tsung Wu (Ming Chi University of Technology)	
11:00-11:30	**PL-3: Prof. Youn-Woo Lee** (Seoul National University) Beyond critical point
11:30-11:55	**IL-8: Prof. Huanda Zheng** (Dalian Polytechnic University) Research progress of supercritical CO_2 waterless dyeing and finishing

11:55-12:20	**IL-9: Prof. Hirohisa Uchida** (Kanazawa University) Fabrication of high-performance organic thin film transistors by rapid expansion of supercritical solutions (RESS) using CO_2
12:20-13:30	Lunch time
Session 5: Physicochemical properties and thermodynamics Chair: Prof. Chieh-Ming Hsieh (National Central University)	
13:30-14:00	**PL-4: Prof. Buxing Han** (Chinese Academy of Sciences) Properties of green solvents and their applications in green chemistry
14:00-14:25	**IL-10: Prof. You Han** (Tianjin University) ReaxFF force field development and application in supercritical water reaction
14:25-14:50	**IL-11: Prof. Tae Jun Yoon** (Chungnam National University) Zero-liquid discharge supercritical water desalination: from electrons to molecules to processes.
14:50-15:15	**IL-12: Prof. Cyril Aymonier (**Institute of Condensed Matter Chemistry of Bordeaux) Physico-chemistry in supercritical fluids for a circular economy
15:15-15:30	Short break
Session 6: Natural products, pharmaceutical and biomedical applications Chair: Prof. Ardila Hayu Tiwikrama (National Taipei University of Technology)	
15:30-16:00	**PL-5: Prof. Motonobu Goto** (Nagoya University) Supercritical fluid technology for phytochemicals
16:00-16:25	**IL-13: Prof. Željko Knez** (University of Maribor) Use of high pressure technologies for design of product for pharma Industry
16:25-16:50	**IL-14: Prof. Yusuke Shimoyama** (Tokyo Institute of Technology) Pharmaceutical crystal engineering in supercritical CO_2
16:50-17:15	**IL-15: Prof. Chie-Shaan Su** (National Taipei University of Technology) Particle design of anticancer drug using supercritical fluid technology
17:15-17:30	Closing and award ceremony

Venue information

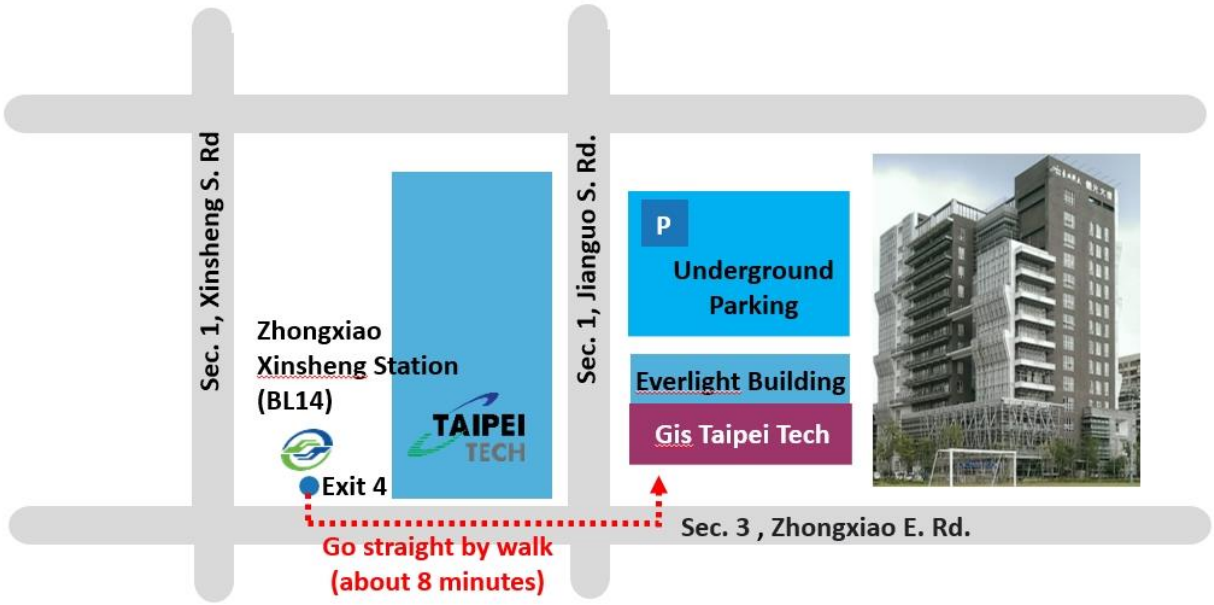
On-site meeting on October 28: GIS Taipei Tech Convention Center

Address: No. 1, Section 3, Zhongxiao East Road, Taipei City

- Main hall: The lecture hall
- Poster session and exhibition: Room 201

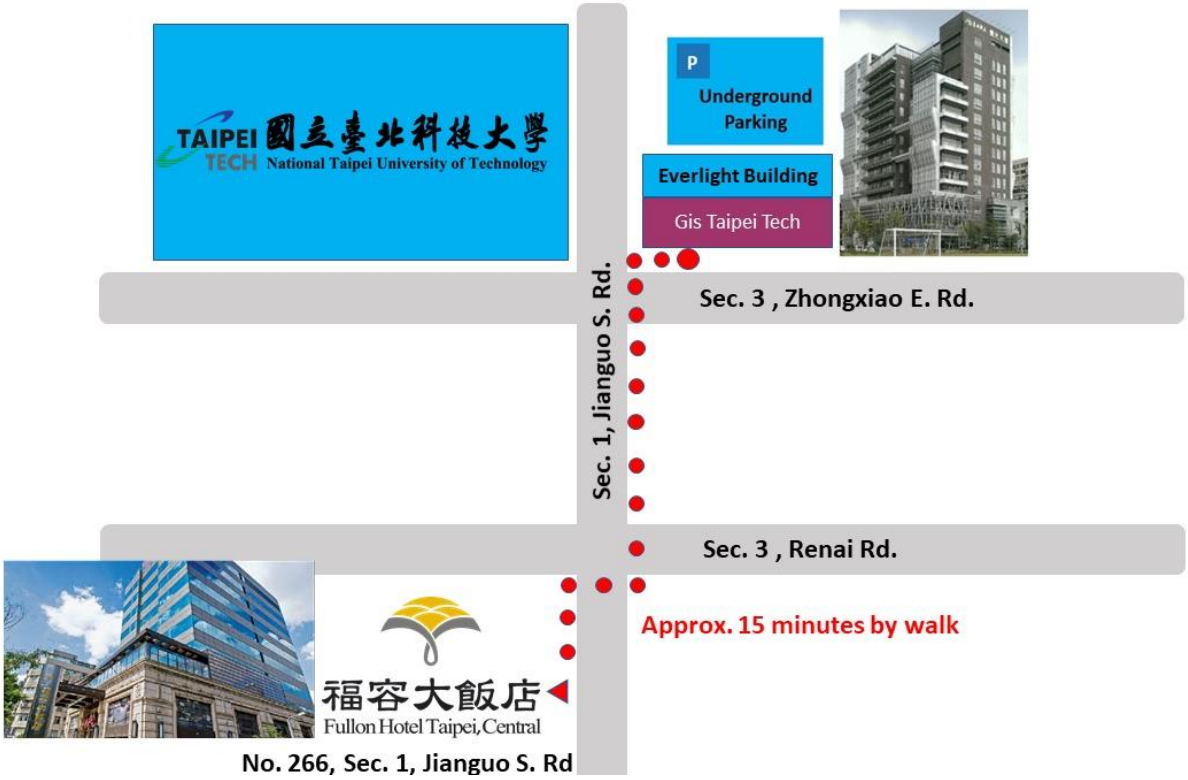
1. From airport to Zhongxiao Xinsheng Station (BL14)

2. From Zhongxiao Xinsheng Station (BL14) Exit 4 to Gis Taipei Tech by walk



Banquet: Fullon Hotel Taipei Central-B1 Lotus hall

Address: No. 266, Section 1, Jianguo South Road, Taipei City
Website: https://www.fullon-hotels.com.tw/tp/en/
(About 15 min walk distance from GIS Taipei Tech Convention center)



Presentation list

Plenary lectures

PL-1 **Supercritical CO_2, the ultimate solution for tissue engineering and regenerative medicine**
Dar-Jen Hsieh*
R&D Center, ACRO Biomedical Co., Ltd.

PL-2 **Chemical reactions in supercritical water and their applications**
Tadafumi Adschiri*
Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

PL-3 **Beyond critical point**
Youn-Woo Lee*
School of Chemical and Biological Engineering and Institute of Chemical Process, Seoul National University

PL-4 **Properties of green solvents and their applications in green chemistry**
Buxing Han*
Institute of Chemistry, Chinese Academy of Sciences

PL-5 **Supercritical fluid technology for phytochemicals**
Motonobu Goto*
Super Critical Technology Centre Co. Ltd. and Institute of Materials Innovation, Nagoya University

Invited lectures

IL-1 **Industrial application of supercritical dyeing in Taiwan**
Shen-Kung Liao*
Department of Fiber and Composite Materials, Feng Chia University

IL-2 **Industrial application of continuous chromatography by using supercritical fluid as eluent for the separation of EPA ethyl ester from fish oil**
Ming-Tsai Liang*
Dynes BioTech. Co., Ltd.

IL-3 **Pharmaceutical applications of supercritical fluid extraction with micro-/nanoparticle formulations**
Ping-Shan Lai*
Department of Chemistry, National Chung Hsing University

IL-4 **Advances of polymer nanocellular foam**

Shu-Kai Yeh*

Department of Materials Science and Engineering, National Taiwan University of Science and Technology

IL-5 **Role of sub- and supercritical solvents for biomass conversion**

Jaehoon Kim*

School of Chemical Engineering, Sungkyunkwan University

IL-6 **Conversion of non-magnetic materials to 2D ferromagnet by CO_2-induced phase engineering**

Bo Gao, Qun Xu*

College of Materials Science and Engineering, Zhengzhou University

IL-7 **Recycling of plastics and leaching of LIB cathode elements by hydrothermal technology**

Masaru Watanabe*

Department of Chemical Engineering, Tohoku University

IL-8 **Research progress of supercritical CO_2 waterless dyeing and finishing**

Qin fang[a,b], Jialing Chen[a,b], Huanda Zheng[a,b,*], Laijiu Zheng[a,b]

[a]*National Supercritical Fluid Dyeing Technology Research Center, Dalian Polytechnic University*

[b]*Liaoning Provincial Key Laboratory of Supercritical CO_2 Dyeing, Dalian Polytechnic University*

IL-9 **Fabrication of high-performance organic thin film transistors by rapid expansion of supercritical solutions (RESS) using CO_2**

Hirohisa Uchida*

Faculty of Frontier Engineering, Institute of Science and Engineering, Kanazawa University

IL-10 **ReaxFF force field development and application in supercritical water reaction**

You Han*

School of Chemical Engineering and Technology, Tianjin University

IL-11 **Zero-liquid discharge supercritical water desalination: from electrons to molecules to processes**

Tae Jun Yoon[a,*], Erica P. Craddock[b], Jeremy C. Lewis[b], John A. Matteson[b], Jong Geun Seong[b], Rajinder P. Singh[b], Katie A. Maerzke[b], Robert P. Currier[b], Alp T. Findikoglu[b]

[a]*Chungnam National University*

[b]*Los Alamos National Laboratory*

IL-12 **Physico-chemistry in supercritical fluids for a circular economy**

Cyril Aymonier*

Institut for Condensed Matter Chemistry of Bordeaux

IL-13 **Use of high pressure technologies for design of product for pharma industry**
Željko Knez*, Maša Knez M.
University of Maribor, Faculty of Chemistry and Chemical Engineering

IL-14 **Pharmaceutical crystal engineering in supercritical CO_2**
Yusuke Shimoyama*
Department of Chemical Science and Engineering, Tokyo Institute of Technology

IL-15 **Particle design of anticancer drug using supercritical fluid technology**
Yu Tse Yen, Wei Ju Chen, Li Ting Lu, Chie Shaan Su*
Department of Chemical Engineering and Biotechnology, National Taipei University of Technology

Oral presentations

OP-1-1 **Investigation of the solvation effect on decarboxylation in supercritical water using computational methods**
Anna Legaspi*, Makoto Akizuki, Yoshito Oshima
Graduate School of Frontier Sciences, The University of Tokyo

OP-1-2 **Cocrystal screening of anticancer drug p-toluenesulfonamide and preparation by supercritical antisolvent process**
Chun-Jui Chien, Yu Tse Yen, Salal Hasan Khudaida, Chie Shaan Su*
Department of Chemical Engineering and Biotechnology, National Taipei University of Technology

OP-1-3 **Excess molar enthalpies of the binary system carbon dioxide + ethyl lactate at 298.15 and 303.15 K and 5.0 – 7.0 MPa**
Hiroyuki Matsuda*, Tomoya Fukui, Kaito Kashioka, Yoshikatsu Furukawa, Kazuyuki Takizawa, Tatsuki Fujita, Kiyofumi Kurihara, Katsumi Tochigi
Department of Materials and Applied Chemistry, Nihon University

OP-1-4 **Prediction of drugs solubility in supercritical carbon dioxide using machine learning**
Ji-En Li, Shi-Han Zhan, Chieh-Ming Hsieh*
Department of Chemical and Materials Engineering National Central University

OP-1-5 **Vapor-liquid equilibria of binary mixture of carbon dioxide with *o*-cresol at elevated pressures, including the near-critical region**
Ching-Yu Lung, Ardila Hayu Tiwikrama*
Department of Chemical Engineering and Biotechnology, National Taipei University of Technology

OP-2-1 **How do "green" media containing CO_2 under high pressure help to create advantageous polymer composites?**

Pigaleva M.A.[a,*], M.S. Rubina[b], A.A. Pestrikova[b], P.S. Kazaryan[b], A.Y. Nikolaev[b], I.S. Chaschin[b], K.S. Stamer[a], A.A. Komiagina[a], M.O. Gallyamov[a, b]

[a]*Faculty of Physics, Moscow State University*

[b]*A.N. Nesmeyanov Institute of Organoelement Compounds, Russian Academy of Sciences*

OP-2-2 **3D CAD/CAM carved - supercritical carbon dioxide decellularized bone matrix for personalized human bone defect repair**

Srinivasan Periasamy[a], Meng-Yen Chen[b], Jing-Jing Fang [c], Jeng-Nan Lee[d], Ko-Chung Yen[a], Hung-Chou Wang [a] and Dar-Jen Hsieh[a,*]

[a]*R & D Center, ACRO Biomedical Co., Ltd.*

[b]*Division of Oral and Maxillofacial Surgery, Department of Stomatology, College of Medicine, National Cheng Kung University*

[c]*Department of Mechanical Engineering, College of Engineering, National Cheng Kung University*

[d]*Department of Mechanical Engineering, Cheng Shiu University*

OP-2-3 **Supercritical carbon dioxide decellularized cartilage graft efficacy on post-traumatic osteoarthritis model**

Periasamy Srinivasan[a], Lien-Chen Wu [b,c,d], Chang-Jung Chiang [b,d], Dur-Zong Hsu[e], Yun-Ju Chen[a], Ming-Yao Chang[a], Dar-Jen Hsieh[a,*]

[a]*R&D Center, ACRO Biomedical Co., Ltd*

[b]*Department of Orthopedics, Shuang Ho Hospital, Taipei Medical University*

[c]*Graduate Institute of Biomedical Materials and Tissue Engineering, College of Biomedical Engineering, Taipei Medical University*

[d]*Department of Orthopaedics, School of Medicine, College of Medicine, Taipei Medical University*

[e]*Department of Environmental and Occupational Health, College of Medicine, National Cheng Kung University*

OP-2-4 **Fractionation of liquid mixtures by continuous countercurrent supercritical CO_2 technique and its industrial application**

Yaping Zhao[a,b *], Huijun Tan[a], Mulugeta Guta[a], Minghua Sun[b]

[a]*School of Chemistry & Chemical Engineering, Shanghai Jiaotong University*

[b]*Nantong Wisdom Supercritical Science and Technology Development Co., Ltd*

OP-2-5 **Evaluation of extraction kinetics of green coffee beans in subcritical water**

Takafumi Sato[a,*], Takeru Kudou[b], Daiki Saito[a], Naotsugu Itoh[a]

[a]*Department of Fundamental Engineering, Utsunomiya University*

[b]*Division of Engineering and Agriculture, Utsunomiya University*

OP-3-1 **Continuous production of biodiesel from spent coffee grounds by supercritical ethanol in a tubular reactor**

Ruengwit Sawangkeaw[a,*], Wirasinee Supang[b], Nutthakit Charoendee[c], Somkiat Ngamprasertsith [c, d], Winatta Sakdasri [e]

[a]*Center of Excellence on Bioconversion/Bioseparation for Value-Added Chemical Production, Institute of Biotechnology and Genetic Engineering, Chulalongkorn University*

[b]*Program in Biotechnology, Faculty of Science, Chulalongkorn University*

[c]*Fuels Research Center, Department of Chemical Technology, Faculty of Science, Chulalongkorn University*

[d]*Center of Excellence on Petrochemical and Materials Technology, Chulalongkorn University*

[e]*Program in Food Process Engineering, School of Food Industry, King Mongkut's Institute of Technology Ladkrabang*

OP-3-2 **Synthesis of ZnO nanoparticles in sub- and supercritical water using a dual-stage flow reactor**

Makoto Akizuki[*], Yongxu Wang, Yoshito Oshima

Department of Environment Systems, Graduate School of Frontier Sciences, The University of Tokyo

OP-3-3 **Low-temperature chemical looping process for methane conversion using oxygen carriers synthesized by supercritical hydrothermal methods**

G. Seong[a], A. Yoko[b], T. Tomai[c], T. Adschiri[a,b,c,*]

[a]*New Industry Creation Hatchery Center, Tohoku University*

[b]*WPI-Advanced Institute for Materials Research (WPI-AIMR), Tohoku University*

[c]*Institute of Multidisciplinary Research for Advanced Materials, Tohoku University*

OP-3-4 **Characteristics of supercritical CO_2 treatment porous silicon**

David J.Y. Feng[a,*], Hung-Yin Lin[b], Hsing-Yu Wang[a], Chen-Yuan Chen[b], Yung-Ho Chiu[c], Mei-Hwa Lee[d,*]

[a]*Department of Electrical Engineering, National University of Kaohsiung*

[b]*Department of Chemical and Materials Engineering, National University of Kaohsiung*

[c]*Taiwan Supercritical Technology Co., Ltd.*

[d]*Department of Materials Science and Engineering, I-Shou University*

OP-3-5 **Supercritical hydrothermal synthesis of facet controlled iron oxide nanoparticles by organic modification**

Akira Yoko[a,*], Yuta Watanabe[b], Gimyeong Seong[c], Takaaki Tomai[d], Tadafumi Adschiria[c,d]

[a]*WPI-Advanced Institute for Materials Research (WPI-AIMR), Tohoku University*

[b]*Department of Chemical Engineering, Graduate School of Engineering, Tohoku University*

[c]*New Industry Creation Hatchery Center, Tohoku University*

[d]*Institute of Multidisciplinary Research for Advanced Materials, Tohoku University*

OP-4-1 **Supercritical carbon dioxide functionalization of polyethylene terephthalate (PET) for flexible biosensors**

Po-Wei Cheng*, Tomoyuki Kurioka, Chun-Yi Chen, Masato Sone, Tso-Fu Mark Chang
Institute of Innovative Research, Tokyo Institute of Technology

OP-4-2 **Temperature and pressure effect on hydrothermal CO_2 electrochemical reduction**

Takaaki Tomai*
Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

OP-4-3 **Preparation of poly(2-hydroxyethyl methacrylate) (PHEMA) composites using supercritical fluid technology**

Wan-Yi Hung[a], Xiang-Wei Cai[a], Salal Hasan Khudaida[a], Yung-Ho Chiu[b], Chie-Shaan Su[a,*]
[a]*Department of Chemical Engineering and Biotechnology, National Taipei University of Technology*
[b]*Taiwan Supercritical Technology Co., Ltd.*

OP-4-4 **Hydrothermal liquefaction of woody biomass in sub and supercritical water: comprehensive characterization of liquefaction products**

Wahyudiono[a], Akira Yoko[b], Gimyeong Seong[a], Takaaki Tomai[c], Tadafumi Adschiri[a,b,*]
[a]*New Industry Creation Hatchery Center, Tohoku University*
[b]*WPI – Advanced Institute for Materials Research (WPI-AIMR), Tohoku University*
[c]*Institute of Multidisciplinary Research for Advanced Materials, Tohoku University*

OP-4-5 **Experimental solubility measurements of disperse dyes in supercritical carbon Dioxide**

Hsu-Chen Wang, Yu-Ming Chen, Chieh-Ming Hsieh*
Department of Chemical and Materials Engineering, National Central University

Poster presentations

PP-01 **Temperature dependence of the viscosity of dispersion of surface organic modified metal oxide nanoparticles fabricated by supercritical hydrothermal method**

Yuko Arai, Takaaki Tomai, Akira Yoko, Seong Gimyeong, Tadafumi Adchiri*
Tohoku university

PP-02 **Hydrothermal separation of polyester from cotton blend fabric**

Mei Mori[a], Jun Inagaki [a], Ryo Yamada[b], Natsuko Tashiro[b], Katsuya Ito[c], and Mitsuru Sasaki[d,e,f*]
[a]*Frontier Materials Technology Center, TOYOBO CO., LTD.*
[b]*Graduate School of Science and Technology, Kumamoto University*
[c]*Films and Functional Materials Frontier Development Department, TOYOBO CO., LTD.*
[d]*Institute of Industrial Nanomaterials, Kumamoto University*

[e]*Faculty of Advanced Science and Technology, Kumamoto University*
[f]*International Research Organization for Advanced Science and Technology, Kumamoto University*

PP-03 **Prediction of drug solubility in supercritical carbon dioxide by PC-SAFT EOS**

Chen-Chen Wu, Yi-Ru Chen, Chieh-Ming Hsieh*
Department of Chemical and Materials Engineering National Central University

PP-04 **Regenerative efficacy of type II collagen solution derived from supercritical carbon dioxide decellularized cartilage on post-traumatic osteoarthritis model**

Lien-Chen Wu[a,b,c] Chang-Jung Chiang[a,c] Periasamy Srinivasan[d], Dur-Zong Hsu[e], Yun-Ju Chen[d], Ming-Yao Chang[d], Dar-Jen Hsieh[d,*]
[a]*Department of Orthopedics, Shuang Ho Hospital, Taipei Medical University*
[b]*Graduate Institute of Biomedical Materials and Tissue Engineering, College of Biomedical Engineering, Taipei Medical University*
[c]*Department of Orthopaedics, School of Medicine,College of Medicine, Taipei Medical University*
[d]*R&D Center, ACRO Biomedical Co., Ltd.*
[e]*Department of Environmental and Occupational Health, College of Medicine, National Cheng Kung University*

PP-05 **Supercritical carbon dioxide decellularized bone matrix enhanced bone regeneration seeded with adipose-derived mesenchymal stem cells**

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PP-06 **Extraction of fucoxanthin with supercritical carbon dioxide using response surface methodology**

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PP-07 **Astaxanthin encapsulation with β-cyclodextrin by utilizing supercritical antisolvent (SAS) process**

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PP-08 **Instant formulation of inhaled beclomethasone dipropionate–hydroxypropyl-beta-cyclodextrin composite particles produced using supercritical assisted atomization**

Hsien-Tsung Wu*, Yao-Hsiang Chuang, Tzu-Chieh Hu, Yu-Xuan Huang

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PP-09 **Characterization and aerosolization performance of gamma-cyclodextrin particles produced using supercritical assisted atomization**

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PP-10 **CO_2-assited subcritical water extraction of bioactive compounds from red ginseng marc**

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PP-11 **Supercritical carbon dioxide extraction of *Sarcodia suiae*: Investigation of biological activity and identification of bioactive compounds by UPLC-Q-TOF-MS**

Shu-Yu Cheng*, Yu-Hsiang Weng, Yuh-Fong Tszeng

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PP-12 **Hybrid supercritical CO_2 extraction process utilizing byproducts from food processing**

Hong-shik Lee[a*], Tae Jun Yoon[b], Seung Eun Lee[a], Ji Sun Lim[a]

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PP-13 **Supercritical fluid extraction of cannabidiol for transdermal application**

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PP-14 **Microparticle production of pirfenidone using rapid expansion of supercritical solutions (RESS) process**

Po-Yi Lin[a], Yun Chang[a], Salal Hasan Khudaida[a], Yung-Ho Chiu[b], Chie-Shaan Su[a,*]

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PP-15 **Synthesis of metal oxide nanoparticles by supercritical hydrothermal methods with flow-type reactors and control of lattice distortion by nanosizing**

Nobutaka Chiba[a], Akira Yoko[b], Gimyeong Seong[c], Takaaki Tomai[d], Tadafumi Adschiri[b,c,d,*]

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PP-16 **The kinetic analysis of surface redox reaction for CeO_2 nanoparticle with (100) facet**

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PP-17 **Improvement of thermal conductivity of hybrid materials by organically surface modification of h-BN filler**

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PP-18 **Supercritical fluids synthesized PMMA composite material for formaldehyde gas sensing**

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PP-19 **Effect of mechanical properties on EVA copolymerized POE material using supercritical foaming processes**

Yan-Ting Ho, Zhi-Quan Li, Shih-Chieh Chang, Guan-Ting Lai, Shen-Kung Liao[*]

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PP-20 **One pot, simultaneous drying and micronization of ecamsule using supercritical CO_2 as an Antisolvent**

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PP-21 **Study on the optimization of subcritical water liquefaction of vinegar residues and acetic acid fermentation conditions for new vinegar products**

Daigo Murakami[a], Shoji Hirayama[a,b], Yuriko Hoshino[b], Kazuharu Yamato[c], Munehiro Hoshino[b,c], Mitsuru Sasaki[d,e,f*]

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PP-22 **Research on extraction of functional components from natural products using green solvents**

Shoji Hirayama[a], Yuriko Hoshino[a], Daigo Murakami[c], Kazuharu Yamato[b], Takuya Suetsugu[a], Munehiro Hoshino[b], Mitsuru Sasaki[d,e,*]
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PP-23 **Enhancement of organic redox capacitors via supercritical CO_2 impregnation of quinones**

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PP-24 **Study of dyeing kinetics on polyester fabrics using supercritical carbon dioxide**

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PP-25 **Effect of supercritical CO_2 treatments of SiO_2 insulating layers of substrates on the performance of organic thin film transistors**

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