Microwave Technologies Toward Carbon Neutral Society

The 5th Global Congress on Microwave Energy Applications

Material Processing

Drug Discovery

Microwave Device

5GCMEA 2024 July 22-25 2024

Kyushu University, Fukuoka, Japan Workshops•Technical Sessions•Exhibitions

Chemistry

Food process

Energy

Program Book

Greeting

The 5th Global Congress on Microwave Energy Applications 5GCMEA2024

Greetings from the Executive Committee Chair

The Global Congress on Microwave Energy Applications (5GCMEA) is the international conference for scientists, researchers and engineers working on the fields on microwave and RF energy applications and their glowing relevant fields. The GCMEA is cooperatively organized by International Federation of Associations in the Field of Microwave and RF Power Engineering (MAJIC), composed of Microwave Working Group (MWG, USA), Association for Microwave Power in Europe for Research and Education (AMPERE Europe), Japan Society of Electromagnetic Wave Energy Applications (JEMEA, Japan), International Microwave Power Institute (IMPI, USA) and China Association of Microwave Power Applications (CAMPA, China). The 1st GCMEA was held in Otsu, Japan in 2008, the 2nd was in California, USA in 2012, the 3rd was in Cartagena, Spain, in 2016, and the 4th was in Chengdu, China in 2022. Now, we are starting to organize to host the 5th GCMEA is held in Fukuoka, Japan, during July 22 -25, 2024.

GCMEA expands and deepens cooperative relationships between scientists, researchers and engineers working on the spreading fields on microwave and RF energy applications and their relevant fields toward establishing carbon neutral society. The conference will particularly promote interchange of excellent ideas among members from MAJIC and all participants come from all around the world. The venue of 5th GCMEA is Kyushu University, Fukuoka, Japan. Fukuoka city is in the southern part of Japan and very convenient for transportation including international airport. You can enjoy your stay in the historical city Fukuoka.

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Hoping to see you at 5 GCMEA 2024 in Fukuoka, Japan.

yoshing hikawa

Prof. Yoshio Nikawa Chair, Executive Committee

Greetings from the JEMEA Session Chair

Instead of the JEMEA Annual Symposium, which is held every year, we have planned a "JEMEA Session" as a session within GCMEA. During this session, in addition to the usual English presentations, it is also possible to give presentations in Japanese, so we are accepting a large number of entries from a wide range of fields, including young people from Japan. There are already many papers and exhibits from all over the world, and you can experience the cutting edge of microwave technology. We hope to see you in Fukuoka in July.



Prof. Koichiro Ohno JEMEA Session Chair, Executive Committee





	2024/7/22
Time	Concert Hall (Room A)
9:30	Opening
9:35	WS1 Einaga
10:05	WS2 Ohno
10:35	WS3 Ishihara
11:05	Coffe Break (15 min)
11:20	WS4 Gregory
11:50	WS5 Tanaka
12:20	Lunch (70 min)
13:30	Opening
13:35	WS6 Wada
14:05	WS7 Takizawa
14:35	WS8 Kono
15:05	WS9 Bell
15:35	Coffe Break (15 min)
15:50	Panel Discussion
16:30	Welcome Reception

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	Workshop	Keynote Lecture	Invited Speech	JEMEA Award Lecture	Oral presentation	Oral presentation (JEMEA)	Poster presentation
	SW	KL	IS	ſ	0	0	Ч

2

Banquet

19:00

KL4 Stefanidis

17:00

0B112 0C112 Break (10 min)

Auresenia

17:00 17:20

16:30

KL2 Sutar

17:30

0D106

IS2 Tsai

0C106 0C107

OB106 OB107

0A104 0A105 0A106

14:30 14:50

15:10 15:30

14:10

Poster (odd number)

13:30 13:50

12:30

Exhibition

Lunch (60 min)

0D107 0D108 0D109

 OB108
 OC108

 Coffee Break (20 min)
 08109
 07109

 0B110
 0C110
 0C111

 0B111
 0C111
 0C111

0A107 0A108 IS3

15:50 16:10

5GCMEA 2024 Time Table (July 22-25, 2024)

Lecture Room 5 (Room D)

2024/7/23

Lecture

Concert

Hall

ime

Lecture Room 4 (Room C)

> Room 2 (Room B)

> > (Room A)

		2024/7/24	+		
		Lecture	Lecture	Lecture	
Time		Room 2	Room 4	Room 5	Ē
		(Room B)	(Room C)	(Room D)	
9:30	KL3 Gerling				9:
10:20		Coffee Brea	k (20 min)		10
10:40	0A201	0B201	0C201	0D201	10
11:00	0A202	0B202	0C202	0D202	11
11:20	0A203	0B203	0C203	0D203	11
11:40	0A204	0B204	0C204	0D204	11
12:00	0A205	0B205	0C205		12
12:20		Lunch (7	(0 min)		12
13:30		Doctor (auto	(and mail of		13
13:50		רטאופו (פעפו	tion +ion		1
14:10			11011		14
14:30	0A206	0B206	0C206	0D205	14
14:50	IS4	0B207	0C207	0D206	14
15:10	Murphy	0B208	0C208	0D207	12
15:30		Coffee Brea	k (20 min)		15
15:50	0A207	0B209	0C209	0D208	16
16:10	1S5	0B210	0C210	0D209	
16:30	Noto	0B211	0C211	0D210	
16:50		Break (1	.0 min)		

0D101 0D102 0D103 0D104 0D105

0C101 0C102 0C103 0C104 0C104

0B102 0B103 0B104 0B105

IS1 Jie OA101

> 11:10 11:30 11:50 12:10

10:50

10:30

0A102 0A103

Coffee Break (20 min)OB101OC101

KL1 Shang

9:40

Opening

9:30

		2024/7/25	10	
		Lecture	Lecture	Lecture
Time		Room 2	Room 4	Room 5
		(Room B)	(Room C)	(Room D)
9:30	KL5 Sugiyama			
10:20		Coffee Brea	ık (20 min)	
10:40	IS6	0B301	0C301	11
11:00	Kon	0B302	0C302	Yamanaka
11:20	0A301	0B303	0C303	J2
11:40	0A302	0B304	0C304	Matsumura
12:00	0A303		0C305	
12:20		Lunch (7	70 min)	
13:30	IS7	OB306	0C306	OD301
13:50	Nishioka	0B307	0C307	OD302
14:10	0A304	OB308	OC308	0D303
14:30	0A305	OB309	0C309	
14:50		Break (1	L0 min)	
15:00	Round			
15:30	table			
16:00	Closing			

Keynote Lecture

KL1 Strengthening Mechanism of Microwave-Matter Interaction—the Application of Microwave Technology in Petroleum and Environmental Fields Hui Shang, Xiayu Fan, Jianchen Sun, Jie Yang

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- KL2 Current Status and Future of Sustainable Microwave Heating Technologies in India Parag Prakash Sutar
- KL3 IMPI Past, Present and Future Influence on the Advancement of Microwave and RF Power Applications John F Gerling

KL4 Chemical Process Intensification via Microwave-Driven Dynamic and Cyclic Thermal Operation

Georgios D. Stefanidis

KL5 Induction Heating and Maxwell's Equations Jun-ichi Sugiyama

Invited Speech

- IS1 Microwave-initiated heterogeneous catalysis for plastic waste upcycling Xiangyu Michael Jie
- IS2 Efficient and Stable Activation by Microwave Annealing of Nanosheet Silicon Doped with Phosphorus above Its Solubility Limit Chun Hsiung Tsai, Chandrashekhar P. Savant P. Savant, Mohammad J avad Asadi, Yu Ming Lin, Ivan Santos, Yu Hsiang Hsu, Jeffrey Kowalski, Lourdes Pelaz, Wei Yen Woon, Chih Kung Lee, James C. M. Hwang,
- IS3 Application of Microwave Energy in the Production of Carbon Nanotubes (CNTs) through Microwave Enhanced Chemical Vapor Deposition and CNT Modification as Bifunctional Catalyst.

Joseph Auresenia, Francis Ian M. Tobias, Jan Patrick G. Si, Mark Angelo T. Tionson, Cyril Beneidct Lugod, Ma. Cristina Macawili, Armando Quitain, Tesuya Kida

- IS4 Solid State RF Energy Solutions are Shaping The Future Mark Murphy
- IS5 High Power GaN Amplifiers for Microwave Heating Hifumi Noto, Koji Yamanaka
- IS6 Sensing applications using microwaves for industrial purposes Seitaro Kon

Workshop

- WS2 Possibility of using Waste Plastics in Development of Microwave Heating-based Ironmaking Process Ko-ichiro Ohno, Tatsuya Kon
- WS3 Effects of Microwave on Direct Decomposition of NO on Metal Oxide Tatsumi Ishihara, Yuta Ikoma, Jun Tae Song, Motonori Watanabe, Miki Inada
- WS4 Microwave Synthesis of Inorganic Materials; Insight and Advances. Duncan Gregory
- WS5 Thermal Plasma Processing for Material Synthesis and Environmental Applications Manabu Tanaka, Takayuki Watanabe

WS6 Vibrating-Electromagnetic-Field-Based Technology as a Strategy Dealing with Carbon Neutral Issues Yuji Wada

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- WS7 Microwave Processing as a New Trend in Materials Science Hirotsugu Takizawa, Jun Fukushima
- WS8 Industrial Applications of Microwave for Decarbonization in Metal Smelting and Mining Kazuya Kono
- WS9 The Development of Efficient Electrified Heating Processes: A Case Study in Using Microwaves in Low Carbon Steel Production Robert Bell, Matthew Sinclair

Oral

- OA101 Evaluation of Hotspots in Catalyst-beds under Microwaves based on Thermodynamic Equilibrium of Ammonia Synthesis Fuminao Kishimoto, Takuya Suguro, William James Movick, Kazuhiro Takanabe
- OA102 Boosting Catalytic Methane Activation by Microwave Heating José Palomo, Atsushi Urakawa
- OA103 Ultrafast catalytic pyrolysis of lignocellulosic biomass by a millimeter-wave-enhanced electric field and alloy catalysts Shuntaro Tsubaki, Sihnya Furukawa, Satoshi Fujii, Yasuhiro Niwa, Wang-Jae Chun
- OA104 Design of atomic scale selective heating of metal cation in zeolites for innovative microwave catalysis Ryo Ishibashi, Fuminao Kishimoto, Kazuhiro Takanabe
- OA105 Microwave enhancement by ZnO nanowire and its application to biocatalytic reaction acceleration Ryuku Oba, Shuntaro Tsubaki, Takuro Hosomi, Takeshi Yanagida, Hisahiro Einaga, Noriyuki Igura
- OA106 Microwave-assisted acceleration of catalytic pyrolysis of lipid by using Na-ZSM-5 and in situ XRD of the catalyst Shunsuke Ota, Shuntaro Tsubaki, Hisahiro Einaga, Jun Fukushima, Kenichi Kimijima,Noriyuki Igura
- **OA107** Mechanistic Insights into Microwave-Assisted Thermal Catalysis for Shale Gas Upgrade Yeonsu Kwak, Quentin Kim, C. Wang, Kewei Yu, Weiqing Zheng, Dionisios G. Vlachos
- OA108 Microwave and Visible Light-Assisted Polymeric Nickel-Iridium Dual-Catalyzed Amination of Aryl Chlorides Abhijit Sen, Valerii Bukhanko, Heeyoel Baek, Aya Ohno, Atsuya Muranaka, Yoichi M. A. Yamada,
- **OB101** Study on the Effect of Microwave Action on the Extraction Efficiency of Tea Polyphenols Zhengming Tang, Dan Li, Tao He, Dezhi Gou, Nouman Rasool, Tao Hong, Kama Huang
- OB102 Experimental Research of Microwave Affect Conductivity of Aqueous Solution of Carnosine and Zinc Chloride

Dezhi Gou

OB103 A novel approach for fast and efficient numerical simulation of microwave heating in liquids during mixing

Bhupinder Singh, Georgios Dimitrakis

OB104 Numerical Simulation of Microwave Heating of Low Moisture Food in a 915 MHz Cavity for Dielectric Properties Estimation

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Olivier Rouaud, Ana-Caroline Frabetti, Tristan Garnault, Hugo Curto, Alexandre Thillier, Lionel Boillereaux, Sébastien Curet

- OB105 Revealing the Quantitative Regulation Rules of Microwave Hotspots in Liquid-Solid Systems via Microscale Heat Transfer Model and In-situ Fluorescence Spectroscopy Kai Liu, Hong Li, Zhenyu Zhao, Xin Gao
- OB106 Permittivity/Conductivity of NiO and Microwave Heating Noboru Yoshikawa
- OB107 Separated Microwave E/H- field Heating of Nano/Micro Metal Particles Noboru Yoshikawa
- OB108 Study on Characteristic of Microwave Deep Drying for PET Materials with Adjustment Method Chongwei Liao, Rong Tang, Changjun Liu
- OB109 Microwave Heating and Curing of Highly Reflective Carbon Fibre Composites through Electromagnetic Resonance Jing Zhou, Yingguang Li
- OB110 Effect of Ozone Treatment on Promoting Carbon Combustion and Enhancing its Microwave Heating Behavior Zhihai Huang, Hajime Hojo, Hisahiro Einaga
- OB111 Improvement of Temperature Uniformity during Microwave Heating of CFRP Composite using Thermosensitive Resonators Di Li, Yingguang Li, Jing Zhou
- OB112 Influence of Temperature on Microwave Heating of Cellulose with Magnetite under Steam Atmosphere

Hiroyuki Tamiya, Sadatsugu Takayama, Keisuke Mukai, Juro Yagi

OC101 Limit of Detection Extensions in Microwave-Enhanced Laser-Induced Breakdown Spectroscopy JOEY KIM TUMBALI SORIANO, Yuji Ikeda

- OC102 Thorium Nuclear Reactor and Microwaves Processing Motoyasu Sato, Aki Fujita, Kyouichiro Kashimura
- OC103 Scaling up of High Temperature Microwave Processing Keiichiro Kashimura
- OC104 Hydrogen Production using Microwave-Assisted Pyrolysis Marilena Radoiu, Ariel Mello
- OC105 Microwave-assisted Combustion of Biological Material Oliver Eckstein, Robert Mueller, Klaus Martin Baumgaertner, Markus Dingeldein, Amandine Guissart, Jens Hofmann, Joachim Schneider, Andrew Charles Dorn
- OC106 Synthesis of SiC Nanosheets by Microwave Heating of SiOx/rGO composites Dai Mochizuki, Yuki Isobe
- OC107 Dephosphorization behaviour of High Phosphorus Containing Iron Ore using Microwave Heating Ko-ichiro Ohno, Tatsuya Kon, Jiazhan Liu, Kenichi Higuchi
- **OC108** Hydrogen Reduction of Tungsten Oxide with Microwave Rapid Heating. Ayana Ono, Alex Ichiro Fujiwara, Jiazhan Liu, Tatsuya Kon, Ko-ichiro Ohno

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OC109 Microwave Heating of Glass

Tamara Golubeva, Stefan Knoche, Volker Ohmstede, Gunter Weidmann, Stefan Bauer, Michael Hahn, Janina Costard

- OC110 Comparative Analysis of Microwave Heating Effects on Ion-Implanted Silicon Wafers Satoshi Fujii, Akira Uedono
- OC111 "Glycerolysis of polyethylene terephthalate using microwave irradiation" K. Ikenaga, K. Fukunaga, T. Tsuboi, T. Sasaki, K. Kusakabe
- OC112 Toward Microwave Decomposition and Recycling of Wind Power GFRP Blades! Kazutoshi Ikenaga
- **OD101 Why does Microwave Plasma CVD Produce Diamonds? Molecular Modeling Verification** Shozo Yanagida, Nobuko Kanehisa, Susumu Yanagisawa, Hirokazu lida
- OD102 Simulation and Analysis of Chemical Vapour Deposition for H2 and CH4: Exploring Growth Rates and Reaction Kinetics Wencong Zhang, Yuqing Huang, Huacheng Zhu
- **OD103 Microwave Plasma Modelling for Heterogeneous Diamond Growth on Ill-Nitrides** Jerome Alexander Cuenca, Soumen Mandal, Oliver Aneurin Williams
- OD104 Investigation on Electrodeless Discharge during Microwave Assisted Pyrolysis Plastics induced by Iron-based Catalysts Xi Shen, Zhenyu Zhao, Xin Gao
- OD105 Investigation of the Capabilities of a 5.8 GHz Microwave Plasma Source for Microchip Decapsulation Amandine Guissart, Jens Hofmann, Joachim Schneider, Robert Mueller, Oliver Eckstein, Markus Dingeldein, Klaus Martin Baumgaertner
- OD106 Study on Reduction Reaction Using Microwave and Radio-Frequency Plasma Satoshi Fujii, Jun Fukushima
- **OD107** Investigation on Mechanism of Microwaves Discharge in Root Vegetables Ryoya Ito, S. Horikoshi
- OD108 Microwave-Induced Atmospheric Pressure Room-Temperature Plasma Jet at Atmospheric Pressure and Its Application in Oral Squamous Cell Carcinoma Treatment Li WU, Wenting Qi, Xian Liu, Junwu Tao, Kama Huang
- **OD109** A Measurement Method for Complex Permittivity of Microwave Plasma Based on BPNN Xingxing Li, Ge Wang, Huacheng Zhu, Yang Yang
- OA201 A Device for Effectively Vaporizing Concentrated Sulphuric Acid by Direct Microwave Heating

Sean H.H. Teng, Steven M.H. Tsao, Eugene Y.C. Tsai, Bob,H.Y. Chen

- OA202 Decarbonization and Ultra-rapid Heating using Microwaves Hideoki Fukushima, Yasuhisa Ushida
- OA203 Enhancement of Microwave Heating Using Spiral Coil Yoshio Nikawa, Keiichi Akasaki, Hidehiro Fukuda, Nobumori Kobayashi
- OA204 Noncontacting Coaxial Rotary Joint for Microwave Ovens Vladimir Bilik
- OA205 3D Printing of Lightweight and Metalized Plastic Microwave Components Nanya Li ,Qiang Cheng, S. K. Ong
- OA206 Development of Solid-State Microwave Devices and Their Application to Microwave Chemical Processes

Takeko Matsumura, Shozo Yanagida, Yuichi Utsumi, Mitsuyoshi Kishihara, Keisuke Suzuki, Masateru Nishioka, Hirokazu lida

The 5th Global Congress on Microwave Energy Applications 5GCMEA2024OA207 Diamond Dielectric Measurements Using an X-band Split Dielectric Resonator Jerome Alexander Cuenca, Soumen Mandal, Jaspa Stritt, Xiang Zheng, James Pomeroy Martin Kuball, Adrian Porch, Oliver Aneurin Williams OB201 Validation Testing of a Near-Field Focused 5.8 GHz Phased-Array Antenna to be Used for Weed Control David Tomsu, Adel Omrani, Guido Link, John Jelonnek, Steffen Probst, Marcel Mallah **OB202** Microwave-Assisted Carbazole Dendrimer Synthesis and Application in Luminescent **Materials** Ken Albrecht OB203 Study of Microwave Effect for an Enzymatic Reaction; Investigation of the Relationship between Complex Permittivity and Microwave Effects Izuru Nagashima, Jun-ichi Sugiyama, Hiroki Shimizu OB204 Exploring the Microwave-Induced Conductivity Enhancement in Solid-State Ionic Materials J. M Catalá-Civera, S. Román-Sánchez, A. Domínguez-Saldaña, L. Bacete-Barchín, B. García-Baños, M. Balaguer, J. M. Serra **OB205** Microwave Specific Effect on Organic Reactions Tohru Yamada OB206 Sterilization of spore-forming Bacillus subtilis by a synergy of spore germination and microwaves Seita Murakami, Satomi Ihara, Miu Okabayashi, Shuntaro Tsubaki, Noriyuki Igura, Yoshimitsu Masuda OB207 The Effect of Chemical Sterilization of Microorganisms under Microwave Irradiation H. Kawashima, S. Yoshitomi, R. Baba, M. Koshimura, S. Ohuchi, T. Yamasaki OB208 The Effect of Microwave Irradiation on Intercellular Chemical Communication of Microbial Cultivation S. Yoshitomi, R. Baba, M. Koshimura, S. Ohuchi, T. Yamasaki OB209 Study on Shape of Heated Sample for Dualband Electromagnetic Coupling-Type Microwave **Heating System** Shimpei Katsuta, Tomohiko Mitani, Naoki Shinohara OB210 Enhanced Chaperone Protein Expression of Bacillus subtilis Spores by Microwaveassisted Sterilization Ibrahim Maamoun, Satomi Ihara, Yoshimitsu Masuda, Shuntaro Tsubaki, Noriyuki Igura **OB211** Microwave-Assisted Carbonization of Wood Biomass Yuta Nishina OC201 Carbon-Recycled Silicon Carbide Synthesis by Microwave Combustion Process Jun Fukushima, Hirotsugu Takizawa OC202 Fungal Mycelia as Green Precursors: Microwave Generation of Carbon Quantum Dots James Watts, Q. Li OC203 A selection chart for microwave sol-gel synthesis of TiO2 nanoparticles Paolo Veronesi, Elena Colombini, Cristina Leonelli OC204 Microwave Synthesis of Metastable Phase In Li-Sn-O Ternary System Using Microwave High-Throughput System Takumi Saito, Jun Fukushima, Hirotsugu Takizawa OC205 The synthesis of three-dimensional mesoporous zeolite materials assisted by microwave heating

Qiuyan Ding, Hong Li, Yilai Jiao, Xin Gao

OC206 Synthesis of Glycerol tert-Butyl Ether Using Sago Hydrochar as Carbon-Based Catalyst **Under Microwave Conditions** Jakaria Bin Rambli, Armando T Quitain, Tetsuya Kida OC207 Microwave-Assisted Hydrothermal Synthesis and Water- Tolerant Superbase Catalysis of Niobium Oxide Cluster Soichi Kikkawa, Yu Fujiki, Vorakit Chudatemiya, Hiroki Nagakari, Kotaro Higashi, Tomoya Uruga, Syuntaro Tsubaki, Naoki Nakatani, Seiji Yamazoe OC208 Enhanced Continuous VOC Air Stream Purification through Microwave-Assisted Catalytic Combustion Xuerui Zheng, Hajime Hojo, Hisahiro Einaga OC209 Microwave-assisted Heterogeneous Catalysis and in-situ Detection of Carbon Deposition Koji Kuramoto, Tomone Sasayama, Fumihiko Kosaka, Masateru Nishioka OC210 Catalytic Ammonia Cracking Using Microwave Jun Woo Park, Baek Kyoung Shin, Hyun Seok Jang, Kyeong Min Park, Jeongbae Kim, Sang Jun Park OC211 Food Waste: B - Hydroxyapatite as a Source of New Chemical Platforms for Biocatalysts **Synthesis** Mariana Patrascu, A. Magdziarz, C. Marculescu OA301 Accurate simulation and experimental measurement of the process of heating water by microwave Kama Huang, Song Jia, Song Wang OA302 Dielectric Modeling, Measurement and Microwave Heating of Low-loss Posts Tao Hong OA303 Temperature Measurement Using MRI in Microwave Heating Yoshio Nikawa OA304 Modeling and validation of the continuous flow microwave heating of orange juice Dorin Boldor, Guilherme Russo, Jorge Andrey Wilhelms Gut OA305 Quantitative Verification of Microwave Heating based on IR/FIR Spectrum Analysis Shozo Yanagida, Takeko Matsumura, Hirokazu Iida OB301 Effect of Ultrasound-assisted Osmotic pre-treatment on Microwave Drying Characteristics and Quality of Radish Slices Chinglen Leishangthem, Parag Prakash Sutar OB302 Efficient Real time-drying monitoring system for Industrial-Scale Continuous Microwave **Dryer of Agricultural Products** Piyush Sharma, Arun Prasath Venugopal, Parag Prakash Sutar OB303 Elucidation of plant growth promotion mechanism by microwave irradiation K. Yamakawa, M. Samezima, R.Murata, N. Suzuki, S. Horikoshi **OB304** Kinetic Evaluation of Microwave-Assisted Chemical Reaction Ryunosuke Baba, Shokichi Ohuchi OB306 Microwave-assisted selective heating of W/O emulsions and its application to microreactor for enzymatic reaction Md Azizul Haque, Natsumi Takeshita, Shuntaro Tsubaki, Takeharu Sugiyama, Noriyuki Igura OB307 In-situ Biodiesel Production from Chinese Tallow Tree Seeds in a Microwave Batch System with Hexane as Co-Solvent

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Dorin Boldor, Mohamad Barekati-Gourdazi, Cristina Mirela Sabliov, Divine Bup Nde

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OB308 Microwave Irradiation Effects on Amide Bond Formation for the Synthesis of Pyrrole-Imidazole Polyamide

Hirokazu lida, Mika Fukatsu, Motoyuki Kamata, Kie Takahashi, Takeko Matsumura

OB309 The techno-economic and life cycle assessment of microwave energy applied in chemical engineering

Na Wang, Zhenyu Zhao, Hong Li, Xin Gao

- OC301 The Electromagnetic Field Simulation of Microwave Spatial Power Combining for **Pyrolysis of Food Waste** Rie Honda, Shuntaro Tsubaki, Noriyuki Igura, Satoshi Fujii
- OC302 Theory and Applications of Microwave Separated Field Materials Processing Yi Zhang, Chaoxia Zhao, Damin Gou, Lingfeng Jiang, Hao Xu, Qiulin Wang, Tingfang Luo, Chao Huang, Kama Huang
- OC303 Mechanistic Insights of Microwave Induced MOFs nucleation via Molecular Probes with **Thermosensitive Fluorescence** Zhenyu Zhao, Xin Gao
- OC304 Multiphysics Simulation of Microwave-Assisted Bulk Metal Melting with Variation in **Susceptor Materials** Shruti C Bhatt, Nilesh D Ghetiya
- OC305 Microwave Assisted Recycling of Spent Lithium Battery Jing Sun, Wenlong Wang, Zhanlong Song
- OC306 Fundamental Research on Microwave Thermal Decomposition of Copper Wiring Coating **Materials**

N. Hachisuga, S. Horikoshi

- OC307 Microwave Decomposition of Polyester-Cotton Blended Fibers Kazutoshi Ikenaga, Ta-ichi Kinjo, Koshiro Kuwamoto, Emika Ikeda, Katsuki Kusakabe
- OC308 Acceleration of CO₂ desorption by radiofrequency selective heating of polyethyleneimine Rikako Hara, Shuntaro Tsubaki, Hidetaka Yamada, Noriyuki Igura
- OC309 Microwave-Assisted Heating for Dehydration of Ethanol to Ethylene using HPW/SBA-15 Zitao Ni, Hajime Hojo, Hisahiro Einaga
- OD301 Correlation equation with dimensionless number for microwave heating R. Yakata, Y.Asakuma, A. Hyde, C. Phan
- OD302 A Programmatic Research of Microwave In-Situ Thermal Recovery of Heavy Oil Tao Liu
- OD303 Development of an effluent free microwave assisted rotary drying cum peeling method for whole garlic bulbs Sudarshanna Kar, Parag Prakash Sutar

Poster

P01 A Compact Hybrid Solar and Electromagnetic Energy Harvester at 2.45 GHz Microstrip Rectenna

Ping Lu, Xue Luo, Yue Liu, Enpu Lei, Kama Huang

- P02 The Effect of Weave Patterns on the Effective Permittivity of Woven Fabrics Jesus Nain Camacho Hernandez, Guido Link
- P04 Microwave-induced high dispersion anchoring of MOFs on SiC surfaces: Built-in electric field dominated process

Xin Gao, Zongliang Kou, Zhenyu Zhao, Hong Li

P05 A Permittivity Measurement Equipment Based on Ridge Waveguide Rui Xiong, Kama Huang, Qian Chen P06 Fundamental Investigation on Antenna-Assisted Enhancement of Microwave Metal Discharges Jen Shun Chen, Po Chien Hsu, Pei Hsing Huang, Chia Lung Kuo **P08** Effects of Magnetic and Electric Fields on Heating Characteristics in Microwave Soldering Takashi Nakamura, Sei Uemura P09 Study on Aggregation Behaviours of Asphaltenes under Various Microwave Electric Field Intensities Xiayu Fan, Jun Li, Huidong Sun, Hui Shang P10 Atmospheric Pressure Plasma Jet Produced by Substrate Integrated Waveguide Resonator Damin Gou, Chaoxia Zhao, Yi Zhang, Kama Huang Microwave Synthesis of Lindqvist-Type [(TaxNb6-x)O19]8- and their Base Catalysis P11 Nattamon Panichakul, Tomoki Matsuyama, Soichi Kikkawa, Koichi Kikuchi, Seiji Yamazoe P12 Real-time measurement of temperature-dependent permittivity for SiC using 2.45 GHz microwave heating Masaya Sato, Eiji Yamasue, Shunsuke Kashiwakura, Shoki Kosai P13 Influence of Dielectric Properties on Temperature Profiles during 915 MHz Microwave Cooking of Cambodian Pâté Sebastien Curet, Sovannmony Nget, Lionel Boillereaux P14 Influence of Particle Arrangement on Microwave Heating Efficiency Jianchen Sun, Jie Yang, Yifei Liao, Hui Shang P15 Size Controlled Synthesis of Ta Oxide Clusters by Microwave Reaction: Application to **Base Catalysts** Supisara Hongpuek, Hiroki Nagakari, Soichi Kikkawa, Seiji Yamazoe P16 Thermal Decomposition on Different Types of Plastics by Microwave-Assisted Catalytic Heating - Nanocarbon Analysis -I Putu Abdi Karya, Kohei Nakagawa, Yuta Kageyama, Al Jalali Muhammad, Takayuki Asano, Fumihiro Nishimura, Toyohiko Nishiumi, Seitaro Mitsudo P17 Microwave Roasting-Leaching Nickel from Indonesian Nickel Laterite Ore Al Jalali Muhammad, Kohei Nakagawa, I Putu Abdi Karya, Aslan Ndita, La Ode Muhammad Darusman, La Agusu, I Nyoman Sudiana, Fumihiro Nishimura, Toyohiko Nishiumi, Takyuki Asano, Hikomitsu Kikuchi, Seitaro Mitsudo P19 Thermal Decomposition on Different Types of Plastics by Microwave-Assisted Catalytic Heating - Generated-gas Analysis -Yota Kageyama, I Putu Abdi Karya, Al Jalali Muhammad, Takayuki Asano, Seitaro Mitsudo, Kohei Nakagawa, Fumihiro Nishimura, Toyohiko Nishiumi P20 Selective CO2-H2O Hydrolysis of Citrus Bioflavonoids Under Microwave Irradiation Kota Nishimure, Jonas Karl N Agutaya, Tetsuya Kida, Armand T Quitain P21 Synthesis of GTBE by Carbon-Based Catalytic Method using Microwave Irradiation Nao Christopher Takata, Jonas Christopher Agutaya, Tetsuya Kida, Armando T Quitain P22 Dielectric Heating Accelerates Ulvan Extraction from Ulva Meridionalis and Its Application to Polysaccharide Film Kazuma Matsuzaki, Shuntaro Tsubaki, Takeharu Sugiyama, Daisuke Tatsumi, Masanori Hiraoka, Pablo B. Sanchez, Noriyuki Igura

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P23 Effect of Microwave Vacuum Drying Conditions on Polyphenol Contents of Olive Pomace Miku Tsuruo, Yuto Inui, Yuyun Sulastri, Kohei Nakagawa, Toyohiko Nishiumi, Takayuki Asano, Seitaro Mitsudo

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