



19th

Asian Pacific Confederation of Chemical Engineering (APCChE) Congress

Working Towards A Sustainable Society

19th ASIAN PACIFIC CONFEDERATION OF CHEMICAL ENGINEERING CONGRESS (APCChE) CONFERENCE 2022

9 -12 August 2022 | 9.00 am – 6.00 pm | Kuala Lumpur Convention Centre

Organised by :

Supported by:

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Information Corner

Welcome to the 19th Asian Pacific Confederation of Chemical Engineering (APCCChE) 2022 Congress.

To facilitate the operation of this event, the Organising Committee would like to seek your co-operation on the following matters:

NAME BADGES

All participants are advised to always wear their name badges during the event for ease of identification. The name badge allows the entrance of the participants to the conference room and refreshment area.

SECRETARIAT & REGISTRATION COUNTER

Both the Secretariat & registration counter ARE located at Level 3, i.e. in front of the conference room area.

OPENING CEREMONY

All participants are invited to the opening ceremony that will be held at 9.20 am on Wednesday, 10 August 2022 at Rooms 304 & 305.

SAFEKEEPING OF BELONGINGS

Participants are advised to take good care of their belongings. All personal items such as cameras, wallets, handphones, etc. should not be left unattended.

PARKING AT KUALA LUMPUR CONVENTION CENTRE

Early Bird Rate: RM18 for entering between 5.00 am – 9.00 am and exiting after 4.00 pm till midnight.

PRAYER ROOM

The Prayer Room is located on Level 3, next to the registration counter.

TEA BREAKS

There will be a free flow of coffee, tea, juices and cookies serves at the foyer area in front of the conference room area.

LUNCH

Lunch will be served at Conference Hall 1.

COVID-19 RESTRICTION

All participants should wear a face mask during the congress, following the requirements set by Ministry of Health Malaysia (face mask is mandatory for all indoor activities).

OTHERS INFORMATION

Should you require any assistance from the organisers, kindly do not hesitate to contact the IEM Secretariat or the Executive Committee members.

Thank you.

The Institution of Engineers, Malaysia (IEM)

Executive Committees

Ir Prof Dr Dominic C. Y. Foo	Chairman
Prof Dr Hon Loong Lam	Co-chair
Ir Thayananthan Balakrishnan	Committee Members
Ir Razmahwata Mohamad Razalli	Committee Members
Ir Ap Dr Chien Hwa Chong	Committee Members
Ir Prof Dr Tiam Ting Tee	Committee Members
Ir Ap Dr Tin Sin Lee	Committee Members
Ir Prof Dr Thomas Choong	Committee Members

International Scientific Committees

Prof Raymond Tan	De La Salle University, Philippines
Prof Kathleen Aviso	De La Salle University, Philippines
Prof Cheng-Liang Chen	National Taiwan University, Taiwan
Prof Xiao Feng	Xi'an Jiaotong University, China
Prof Santanu Bandyopadhyay	Indian Institute of Technology Bombay, India
Prof Jonathan Seville	University of Birmingham, United Kingdom
Prof Pete Halley	University of Queensland, Australia
Prof Chen Binghui	Xiamen University Malaysia
Prof Cheng-Tung Chou	National Central University Taiwan
Prof Shing-Yi Suen	National Chung Hsing University
Prof Shaobin Wang	University of Adelaide, Australia
Prof Moses Oludayo Tade	Curtin University, Australia
Dato Mohd Nazlee Kamal	Solution Engineering, Malaysia
Prof Yasunori Kikuchi	University of Tokyo, Japan
Prof Yoshiyuki Yamashita	Tokyo Univ of Agriculture and Technology, Japan
Prof Jerry Heng	Imperial College London, United Kingdom
Prof Pau Loke Show	University of Nottingham Malaysia
Prof Vasiliki Kazantzi	University of Applied Sciences of Thessaly, Greece
Prof Chang Kyoo Yoo	Kyung Hee University, Korea
Prof Shuichi Yamamoto	Yamaguchi University, Japan
Prof Guohua Chen	Hong Kong Polytechnic University, China
Prof Woo-Sik Kim	Kyung Hee University, Korea
Prof Guangwen Xu	Senyang University of Chemical Technology

Message from IEM President

The Asia Pacific Confederation of Chemical Engineering (APCChE) Congress is back in Malaysia again after sixteen years this time with the theme "Working Towards a Sustainable Society". Indeed, this is a timely reminder to all of us that we must do whatever we can to ensure a truly sustainable future. As mankind is facing a myriad of survival problems such as climate change, food security, energy crisis and more, we need experts who are capable of systemic, holistic thinking to solve these inter-related issues. It is undeniable that Chemical Engineers are well-equipped to contribute in a wide variety of ways to offer solutions to the problems we are facing.



In Malaysia, the Chemical industry is one of the major drivers of our economic growth. The export of chemicals and chemical-related products recorded a height of RM70.68 billion for the year 2021, showing significant growth of 39.3% compared to the previous year. The Ministry of International Trade and Industry (MITI), in collaboration with the Chemical Industries Council of Malaysia (CICM), is going to unveil the Chemical Industry Roadmap (CIR) 2020 - 2030, which will further stimulate the industry and provide more opportunities for all the stakeholders.

As highlighted in the Sapporo Declaration, which was made during the 18th APCChE Congress in Sapporo, Japan in 2019, we should embrace the People, Planet, Prosperity, Peace and Partnership in our effort to implement the 17 Sustainable Development Goals. We should also pursue human well-being through the evolution of Chemical Engineering and related technologies. I am sure more exchange of minds between Chemical Engineers from the 14 member countries of APCChE will benefit all of us in the Asia Pacific region.

I have full confidence that this regional engineering body will be able to unite all the chemical engineers of the region to meet the challenges of our era, in seeking solutions that will improve the quality of life for everyone in the Asia Pacific.

I would like to congratulate APCChE for its achievements and wish APCChE all the best in future endeavours. Last but not least, a big thank you to the Chemical Engineering Technical Division of IEM for the great effort in organising the 19th Asian Pacific Confederation of Chemical Engineering (APCChE) Congress 2022 here in Kuala Lumpur, Malaysia.

Thank You and with warmest regards,

A handwritten signature in blue ink, appearing to be 'Norlida'.

Ir. Prof. Dr. Norlida Buniyamin
IEM President

Welcoming Message from the Organising Chair

Selamat Datang, (Welcome) to Kuala Lumpur!

It is with great pleasure to welcome you to the 19th Asian Pacific Confederation of Chemical Engineering Congress (APCChE 2022). With the ongoing COVID-19 pandemic, it was indeed challenging in organizing this congress. Fortunately, with the aid of COVID vaccines, many countries including Malaysia have now entered the transition phase with more relaxed travel restrictions. Hence, we can host the congress in a hybrid mode, i.e., with some participants attending the conference physically in Kuala Lumpur.

The theme of APCChE 2022 is "Working Towards a Sustainable Society". Hence, the conference is meant to showcase various cutting-edge research surrounding the theme of sustainability. The underlying principles for this theme are the Sustainable Development Goals (SDGs) launched by the United Nation in the year 2015, which has now become the main guidance for sustainability in various sectors. An important achievement within the APCChE community was the launch of the Sapporo Declaration during the 2019 Congress held in Sapporo, Japan. If you have yet to read the declaration, please be sure to visit the APCChE website (<https://apcche.org/Sapporo-declaration>).

The organizing team of APCChE 2022 – Chemical Engineering Technical Division of The Institution of Engineers, Malaysia (CETD, IEM) would like to thank all parties that have assisted in the successful organising of the Congress during the challenging time in the past two years. We hope all attendees – both physical and virtual, will gain the most in this Congress, to embrace sustainability for a better living environment.

Stay safe!

Thank you.

Professor Ir. Dr. Dominic C. Y. Foo FIEM, FASc, FICChemE, PEng, CEng, FHEA, ACPE
Organising Chair, APCChE 2022
President, Asian Pacific Confederation of Chemical Engineering



Plenary Speakers



YBhg. Dato' Seri Ir. Prof. Dr. Zaini Ujang

Secretary General, Ministry of Environment and Water

YBhg. Dato' Seri Ir. Prof. Dr. Zaini Ujang is the Secretary General of Environment and Water since March 2020. Before his current assignment, he was secretary general for various ministries of higher education, energy, green technology and water. He was appointed professor in environmental engineering in 2002 and became Vice-Chancellor of Universiti Teknologi Malaysia (2008-2013).

He has vast academic and professional networks, as former Vice President, International Water Association (2004-2006), journal editor of Water Science and Technology (Since 2000), visiting professor at Imperial College London, Lund (Sweden), Tsukuba (Japan) and research associate at MIT. He has published more than 300 articles and written 46 books. He was the first recipient of the prestigious Merdeka Award (scholastic achievement) in 2009.



Mr. Kamal Bahrin B Ahmad

Senior Vice President & Chief Executive Officer, PETRONAS Refinery & Petrochemical Corporation Sdn. Bhd.

Mr. Kamal Bahrin bin Ahmad (58) was appointed as a Senior Vice President and Chief Executive Officer of PETRONAS Refinery & Petrochemical Corporation Sdn Bhd (PRPC) effective 1 January 2021 to steer PRPC's strategic and operational growth in adding value to PETRONAS' overall business. He holds a Bachelor of Science Degree in Chemical Engineering from the University of Texas-Austin, United States of America (USA). Kamal completed the Advanced Management Program at Harvard Business School in 2017.

With over 35 years in the company, Kamal has played many technical and leadership roles in various PETRONAS businesses. One of his career highlights was during his tenure in South Africa, where he successfully led the transformation of Engen's refinery operations to world-class reliability performance. Kamal led the smooth transition of Melaka Refinery from a joint venture to an entity wholly owned by PETRONAS, achieving synergy value by running the refinery's full value chain as a single entity. When in PGB, he also led the successful implementation of Third Parties Access in 2018, realising the Gas Market Liberalisation vision under the 10th Malaysian Plan.

Kamal has been serving as a Board member of several PETRONAS wholly-owned companies like PRPC Utilities and Facilities Sdn Bhd and Pengerang Power Sdn Bhd since July 2017. He also served as director for several PETRONAS Joint Venture companies since 2017 like Pengerang Terminals (Two) Sdn Bhd, Trans Thai-Malaysia (Malaysia & Thailand), Kimanis Power Sdn Bhd, Pengerang Gas Solutions Sdn Bhd, Pengerang LNG (Two) Sdn Bhd and Gas Malaysia Bhd. As a council member of the Malaysia Gas Association (MGA), Kamal plays an active role in the gas industry.



YBhg. Dato' Dr. Mohd Nazlee Kamal

Chief Executive Officer, Solution Biologics Sdn. Bhd.

YBhg. Dato' Dr. Mohd Nazlee Kamal, is the Director and Chief Executive Officer at Solution Biologics Sdn. Bhd. He holds a PhD in Chemical Engineering from the University of Queensland, Australia, and a M.App.Sc in Biotechnology from University of New South Wales, Australia, and a Bachelor of Science in Chemical Engineering from Oregon State University, USA.

Dato' Dr. Mohd Nazlee has over 30 years of diverse industry background in strategy, biotechnology and life sciences which including 15 years of executive management experience. He possesses strong expertise in both technical and business aspects in these areas. With the recognition of his wide industrial leadership, he played a pivotal role in the formulation of Malaysia's National Biotechnology Policy in 2005.

Dato' Dr. Mohd Nazlee served as the CEO of Bioeconomy Corporation (previously known as BiotechCorp) from 2011-2016. He played a leadership role in the rebranding and repositioning of the company to facilitate the nation's trajectory into the World Bio-economy arena. He was also invited to serve on the Global Bio-economy Council in Berlin from 2015-2017.

Dato' Dr. Mohd Nazlee has a wealth of experience encompassing marketing and technology portfolios with multinational companies such as Amersham Biosciences, Sartorius and B. Braun Biotech. In addition, he invented the "External Spinfilter" now marketed by Sartorius BBI Systems (Patent No. PI9701436MY-131798-A). He has assumed leadership roles and also served on the boards of MAGIC, FRIM, NIBM, and Bioeconomy Corporation (previously known as Biotech Corporation).

Keynote Speakers



**Professor Moses
Oludayo Tade**

Curtin University,
Australia

Professor Moses Oludayo Tade has an extensive leadership and management expertise in higher education across several portfolios for over three decades. He is a visionary and strategic leader; a change agent; mentor and an extensive successful developer of people and the next generation of leaders at various levels. He is also a team leader, negotiator and successful team member across various levels of management. He is a research leader in Chemical Engineering and has successfully supervised over 70 PhD students and research fellows (jointly with colleagues). He is an External Examiner for many engineering degree programs worldwide and an International Accreditor for the Institution of Chemical Engineers (IChemE). He is the Founding Editor-in-Chief for Asia-Pacific Journal of Chemical Engineering, www.apjchemeng.com, FIChemE, CEng, HonFIEAust, CPEng, FNAEng and a John Curtin Distinguished Professor at Curtin University. He is a Highly Cited Research in 2019, 2020, 2021, respectively.



**Professor Jerry Y. Y.
Heng**

Imperial College
London, UK

Professor Jerry Y. Y. Heng is currently a Professor in Particle Technology and Director of UG Studies at the Department of Chemical Engineering at Imperial College London. He obtained his PhD in Chemical Engineering from Imperial College London (2006) and a B.Eng in Chemical Engineering from Universiti Teknologi Malaysia (2002). His research group aims to understand the role of surfaces and interfaces in powder-based manufacturing and formulation, with current efforts focused on investigating powder surface anisotropy and the development of crystallisation as a separation strategy for the purification of biopharmaceuticals. Jerry is currently an EPSRC Manufacturing the Future Fellow, a Fellow of the Royal Society of Chemistry and Editor-in-Chief of the IChemE's journal - Chemical Engineering Research and Design.



Prof. Ir. Dr. Aziz Raman
University of Malaya

Professor Ir. Dr. Abdul Aziz bin Abdul Raman was appointed as the Deputy Vice-Chancellor (Development), Universiti Malaya (UM) on 2020. He graduated with a Bachelor in Chemical Engineering Degree from UM. He undertakes research in the field of chemical engineering focusing in the areas of mixing using stirred vessels, green technology and advanced wastewater treatment. To date, he has supervised more than 100 PhD and Master students and has published more than 300 papers in high impact journals and conference proceedings. There are 12 patents registered under his name. As a result of his excellent achievements in research, Prof Aziz was recognized as one of the Highly Cited Researchers in year 2020 by Clarivate and one of the Top Research Scientists in Malaysia.



**Prof. Santanu
Bandyopadhyay**

Indian Institute of
Technology, Bombay

Prof. Santanu Bandyopadhyay is currently Praj Industries Chair Professor, Department of Energy Science and Engineering, at the Indian Institute of Technology Bombay (IIT Bombay). He is currently one of the Editors-in-Chief for Process Integration and Optimization for Sustainability (Springer Nature) as well as Associate Editors for the Journal of Cleaner Production (Elsevier), Clean Technologies and Environmental Policy (Springer Nature), and South African Journal of Chemical Engineering (Elsevier). His research interest includes Process integration, Pinch Analysis, Industrial energy conservation, Modelling and simulation of energy systems, Design and optimization of renewable energy systems, etc. Since 1994, Prof. Bandyopadhyay has been associated with and contributed towards various developmental, industrial, and research activities involving different structured approaches to process synthesis, energy integration and conservation, as well as renewable energy systems design. He has published over 300 technical articles in journals and conferences, and participated in many industrial projects. He is a fellow of the Indian National Association of Engineering (INAE).



**Prof. Iftekhar
Abubakar Karimi**
National University of
Singapore

Professor Iftekhar Abubakar Karimi specializes in Process Modeling, Synthesis, Integration, Optimization and Development; Energy Systems and Energy Efficiency; Machine Learning, Oil and Gas supply chains; Carbon Capture & Utilization; and Technoeconomic Assessments. His Process Systems Engineering (PSE) team helps guide the Green Energy Programme in the most promising directions. He has published extensively in the area of PSE, with >8000 citations till date, and has led many industry-collaborative research and consulting projects (e.g. SRC, SLNG, SPPG, Shell, Rolls-Royce, Qatargas). Professor Karimi's work is also supported by NRF, NCCS, EMA, ExxonMobil and SgEC.

Industrial Speakers



Ir. Dr. Chan Tuck Leong
Head of LNG Projects, PETRONAS



Dr. Zulfan Adi Putra
ExxonMobil Business Support
Centre Malaysia Sdn Bhd



Mr. Tee Wooi Keat
Kuala Lumpur Kepong Berhad



Mr. Karl Kolmetz
KLM Technology Group



Ir. Rafil Elyas
East 101



Dr. Chin Jit Kai
Nordin Technologies



Ir. Shyam Lakshmanan
IOI Edible Oils



Mr. Hans Tan
South East Asia, Honeywell



Ms. Nurfarhana Abdul Rahim
PETRONAS, Group Health, Safety &
Environment Division



Ir. Razmahwata Mohamad Razalli
IGL Services Sdn Bhd



Mr. Charles Wiroon
Global R&D Co., Ltd. Thailand



Ir. Shum Keng Yan
Johnson Controls (M) Sdn Bhd

Question & Answer Session

Participants can direct the question to the presenters during the event by sending question via online. Kindly scan the QR code below to post your question.

ROOM 304 & 305
Plenary Sessions



ROOM 302



ROOM 303



ROOM 305



ROOM 306



BR 1
(Online Room)



BR 2
(Online Room)



Programme - 9 August 2022 (Tuesday)

9:00 am	IEM Chemical Engineering Design Competition (Virtual Platform)
2:00 pm	Chem-E-Car Competition (Room 301)
3:00 pm	Registration & Welcoming Reception (Foyer Room 301)
6:00 pm	End of Day 1

Programme - 10 August 2022 (Wednesday)

8:00 am	Registration					
9:00	Arrival					
9:20	Opening Ceremony (Rooms 304 & 305)					
9:40	Tea Break					
10:00	Plenary Session 1 - YBhg. Dato' Seri Ir. Prof. Dr. Zaini Ujang (Secretary General, Ministry of Environment and Water)					
11:00	Plenary Session 2 - Mr. Kamal Bahrin B Ahmad (Senior Vice President & Chief Executive Officer, PETRONAS Refinery & Petrochemical Corporation Sdn. Bhd.)					
12:00 pm	Plenary Session 3 - YBhg. Dato' Dr. Mohd Nazlee Kamal (Chief Executive Officer, Solution Biologics Sdn. Bhd.)					
1:00	Lunch				Virtual Poster 1 1004,1005,1007,1009 1018,1024,1026,1027	
	Room 305	Room 302	Room 303	Room 306	BR 1	BR 2
2:00	Session 1 - Chemical Engineering Education / PSE Prof Tade 1134,1055	Session 2 - Process Systems Engineering 1217 Ir Razmahwata 1201, Ir Shum	Session 3 - Chemical Engineering Fundamentals Ir Dr Chan 1106,1014 1015	Session 4 - Reaction Engineering & Catalyst 1070,1094 1095,1162	Virtual Session 1 - Chemical Engineering Fundamentals 1008,1016 1045	Virtual Session 2 - Cleaner Production and Circular Economy 1181, 1182 1189, 1196
3:20	Tea Break & Physical Poster 1 1034, 1049, 1054, 1076, 1080, 1082, 1088, 1109, 1113, 1131				Virtual Poster 2 1028,1029 1030,1061	
4:00	Session 5 - Process System Engineering Prof Bandyopadhyay 1020,1040 1062,1158	Session 6 - Chemical Engineering Fundamentals 1021,1042 1046, Dr Chin 1171,1193	Session 7 - Bioproducts, Food & Bio- processing 1023,1085 Prof Heng 1089,1107	Session 8 - Reaction Engineering & Catalyst / Chemical Engineering Fundamentals 1120,1104 1098,1111 1249,1116	Virtual Session 3 - Chemical Engineering Fundamentals/ Education 1175,1250 1235,1137 1002,1010	Virtual Session 4 - Nano- technology and advanced materials 1093,1097 Virtual Session 5 1101,1170 1019,1096
6:00	End of Day 2					
6:30	DINNER @ PERDANA KLCC					



Physical Poster



Virtual oral



Virtual poster

Programme - 11 August 2022 (Thursday)

Time	Room 305	Room 302	Room 303	Room 306	BR 1	BR 2
8:00 am	Registration					
9:00	Session 9 - Reaction Engineering & Catalyst 1138,1150 1164,1165	Session 10 - Process System Engineering Kolmetz 1133,1149 Dr Zulfan	Session 11 - Nano-tech and Advanced Materials / Chem Eng Fundamentals 1036,1081 1190,1248	Session 12 - SDG Special Symposium Prof Matsukata 1043,1047 1050	Virtual Session 6 - Bioproducts, Food & Bio-processing 1075,1077 1092,1117	Virtual Session 7 - Process System Engineering 1006,1038 1059,1159
10:20	Tea Break & Physical Poster 2 1173, 1225, 1123, 1105, 1108, 1099, 1115, 1255, 1258, 1219 & 1222				Virtual Poster 3 1064,1100	
10:40	Session 13 - Cleaner Production and Circular Economy Prof Aziz 1069,1197	Session 14 - Process System Engineering Ir Chong 1160,1163	Session 15 - Oil & Gas / Reaction Engineering & Catalyst 1203,1213 1232,1215	Session 16 - WINNERS OF RESEARCH PAPER COMPETITION 1103,1228 1229,1230	Session 12 - SDG Special Symposium (Virtual)	Virtual Session 8 - 1058,1060 1068,1074 Virtual Poster 4 1112,1135 1151,1183
12:00 pm	Lunch					
1:20	Session 17 - Chem Eng Fundamentals / PSE 1156,1214 1157, Rafil	Session 18 - Cleaner Production and Circular Economy Nurfarhana 1212,1234 Hans Tan	Session 19 - Bioproducts, Food / Reaction Engineering 1154,1208 1168,1176	Session 20 - Sustainable palm oil / PSE 1167,1025 Mr Tee, 1121	Virtual Session 9 - Process System Engineering 1184,1198 1200,1204	Virtual Session 10 - Reaction Engineering & Catalyst 1078,1102 1127,1139
2:40	Tea Break				Virtual Poster 5 1241,1242	
3:00	Session 21 - Bioproducts, Food & Bio-processing 1118,1124 1129,1142 Mr Wiroon 1180	Session 22 - Reaction Engineering & Catalyst 1195,1205 1210,1211 1199,1037	Session 23 - 1114,1169 1202,1207 1155,1236	Session 24 - Cleaner Production and Circular Economy 1187,1072 1110,1152 1179,1260	Virtual Session 11 - 1126,1051 1066,1067 1090	Virtual Session 12 - Reaction Engineering & Catalyst 1140,1141 1185,1194 1240
5:00	Closing Ceremony					
5:20	End of Day 3					



Physical Poster



Virtual oral



Virtual poster

Programme - 12 August 2022 (Friday)

Time	BR 1	Time	BR 2
9:00 am	Virtual Session 13 - Reaction Engineering & Catalyst 1041,1053 1056,1057	9:00	Virtual Poster 6 1065,1084 1119,1243
10:20	Virtual Session 14 - Bioproducts, Food & Bioprocessing 1172,1231 1013,1122	10:00	Virtual Session 17 Chemical Engineering Applications (Part 1) 1178,1251 1186,1218 1091,1087 1147
11:40	Virtual Session 15 - Sustainable Palm Oil 1130,1209 Ir Shyam,1247	12:20 pm	Virtual Session 17 Chemical Engineering Applications (Part 2) 1244,1245 1246,1063 1237,1086 1206,1238 1039
1:00 pm	Virtual Session 16 - Chemical Engineering Applications 1071 Prof Karimi 1073,1132,1145		



Virtual oral



Virtual poster

Time	Workshop (Jasmine Room, Impiana KLCC Hotel)
9:00 am	Workshop 1 - Fluid Flow, Pressure Drop & Hydraulic Analysis
	Lunch
1:00 pm	Workshop 2 - Economics of Industrial Decarbonisation
5:30 pm	End of Conference

BIOPRODUCT, FOOD & BIOPROCESSING

Paper ID	Title
1013	Novel Approach for the Characterization of Powder Caking
1023	Facile synthesis of magnetic lipase/cu ₃ (po ₄) ₂ hybrid nanoflower for biocatalytic applications
1063	A novel approach to estimate the solubilities of non-steroidal anti-inflammatory drugs (NSAIDs) in supercritical carbon dioxide by PC-SAFT equation of state
1075	Effect of coagulant composition on soy protein-based fibers prepared by wet spinning
1076	Production of chain oligopeptides from diketopiperazine by pulse discharge method
1077	Exploration of L-tryptophan assisted desalination process in a simulated porous media environment
1085	Activation of lipase by the hydration-aggregation method and its application to triglyceride modification in nonaqueous media
1089	Synergistic antifungal activity by combining amphotericin B with lipidated chitinase
1092	Microencapsulation of extracted holy basil oil in modified starch by spray drying
1109	Stearate Liquid Marbles for Bacterial Cellulose Production: Preparation conditions of Bacterial Cellulose
1117	Fabrication of glyco-immobilized fluorescent PMMA particles encapsulating magnetically responsive Fe ₃ O ₄ particles
1118	Encapsulation of Alpha-Mangostin into Chitosan-Oleic Acid Complexes: An Attempt to Improve Its Stability and Oral Bioavailability
1123	Preparation of bacterial cellulose membrane via liquid marble method and its water permeation behavior
1124	Control of Adhesion property of Mussel Foot Protein by Fusing Soluble Protein
1129	Development of Flow-through Microwells Made of Porous Materials for Perfusion Culture of Mammalian Cells
1131	Open cultivation of microorganisms in Pickering emulsions stabilized by stearate microparticles
1142	Co-assembly with peptide amphiphiles through complementary hydrogen bonding facilitates non-endocytic cellular internalization of small molecules
1145	Self-assembled peptide fibers with enzymatic reactivity for potential delivery of biotherapeutics
1154	A mechanistic model based approach with on-line monitors for accelerated food drying process development
1155	The role of surge tanks for integrated bioprocessing
1172	Techno-economic Comparison of Different Reactor Types Used in the Manufacture of Fructooligosaccharides from Sucrose
1208	High-throughput formulation screening methods for prediction of protein stability
1231	Recovery of Active Pharmaceutical Ingredients from Unused Solid Dosage Form Drugs

CHEMICAL ENGINEERING EDUCATION

Paper ID	Title
1002	Integrating engineering ethics into chemical engineering curriculum using cdio framework
1019	Virtual Reality Enhanced Education for Undergraduate Chemical Engineers
1043	SCEJ's actions in line with the Sapporo Declaration for achieving the SDGs
1044	How Do Chemical Engineers Contribute to Future by Implementing the Sapporo Declaration?
1047	Fostering Business for Sustainable Developments With Engineering Knowledge
1055	Latest developments in microalgae technology
1193	A New Invention on Energy-Saving High Efficiency Mixer For The Industrial Scale Practice

CHEMICAL ENGINEERING FUNDAMENTALS

Paper ID	Title
1004	Prediction of temperature distribution during microwave heating by three dimensionless numbers
1005	Study for hydration structure in sodium chloride solution through refractive index during microwave irradiation
1007	Maintenance of surfactant desorption by changing microwave irradiation mode
1008	Important factors for modification of liquid-liquid interface during microwave irradiation
1009	Non-thermal effect for refractive index of water during pulse microwave irradiation
1014	FABRICATION AND EVALUATION OF GAS BARRIER PERFORMANCE OF POLYINDENE MEMBRANES BY RF-PECVD
1015	Physicochemical properties of emulsified d-limonene spray-dried powder
1016	Development of a ZrO ₂ -Coating Technique by a Sol-Gel Process
1018	Refractive index measurement of glucose aqueous solution during microwave irradiation
1021	Release characteristic of 1-methylcyclopropene from coated paper containing 1-MCP inclusion complex in α -cyclodextrin
1042	Phase equilibrium measurement and thermodynamic correlation of polybutadiene and dichloromethane mixture
1045	Technical Analysis for the Use of an ESP Combined with Packing Tools for an Artificial Lifting System
1046	Synthesis of Natural Blue dye from Butterfly Pea (<i>Clitoria ternatea</i>) flowers and its application on Cotton fibres using Ultrasonic-assisted techniques
1106	Partition coefficient of a new odorant, 2-hexyne, in liquefied petroleum gas cylinder
1137	Determination of Peclet number from flow visualization inside an extraction column of "emulsion-flow type"
1156	Solid-Liquid Equilibria of Ternary System Ethanol + Diethyl Carboanate + Diphenyl Carbonate
1157	Prediction of Phase Equilibria and Transport Properties Using ASOG and PRASOG Group Contribution Methods
1171	Development of a Comprehensive Screening Method of Deep Eutectic Solvents for the Separation of Toluene-Heptane Mixtures
1175	Influence of osteopontin on calcium oxalate crystallization in artificial urine
1201	Analysis of Cashew (<i>Anacardium Occidentale</i>) Nut Shell as Waste-derived Lost Circulation Material for Water-based Drilling Fluids
1229	Characterization of Malaysian Jatropha Seed Oil and Discovering Process of Powdered Jatropha Leaves
1235	Adsorption of Paraquat at High Concentration in Synthetic Wastewater by Using TiO ₂ -Coated on Grain Activated Carbon from Coconut Shell
1248	Shell waste based functionalised coatings for generating superhydrophobic surfaces
1249	A quick and contactless analysis of powder mixing conditions using a shear-sensitive coloured tracer
1250	Application of Intelligent Data Analysis System (IDAS) in Methamphetamine-HCl FTIR Spectra
1219	Transparent freestanding Ti ₃ C ₂ T _x MXene conductive film for surface-functionalized electromagnetic wave shielding and electronic materials using polar aprotic organic solvent
1222	Effective radiative cooling of dark-tone paints prepared by near-infrared reflective pigments

OIL, GAS & PETROCHEMICALS

Paper ID	Title
1203	Mechanistic Understanding of the Filter Cake Characteristics of Water-based Drilling Fluids with Waste Coconut Husks using 2k Factorial Design
1213	Controlling the pH of prehydrated bentonite slurry containing acidic bio-based additive and its performance on filtration properties
1232	Investigation of Jatropha-Based Inhibitors on Penara Waxy Crude Oil Apparent Viscosity

CLEANER PRODUCTION & CIRCULAR ECONOMY

Paper ID	Title
1039	Development and Optimization of Accelerated Weathering of Limestone for CO ₂ Capture from Cement Industry Gas Emission
1050	Transition pathway towards 100% renewable energy across the sectors of power, heat, transport, and desalination for the Philippines
1069	Hydrophobic eutectic solvents for sustainable cathode recycling of lithium-ion batteries
1072	Evaluation of recycled carbon fiber recovered by chemical decomposition from CFRP using nitric acid treatment
1100	Energy saving of fluid transportation of ground thermal energy system by drag reducing effect
1110	Consumer willingness for introducing paper bags made from agricultural waste in Egypt
1151	Demonstration of the effectiveness of the separation technique of lithium-ion battery cathode materials using the electric pulse method for efficient separation
1152	Development of a thermoelectric composite for sustainable energy-harvesting from recycled carbon fibre incorporated with CZTS.
1179	The overlooked potential of ultra-low temperature biochar
1181	Valorization of durian biomass waste into biochar-derived supercapacitor electrode materials
1182	A study on green and sustainable conversion of coffee ground waste into activated carbon via novel advanced self-activation approach
1186	Life cycle assessment and techno-economic analysis on mixed matrix membranes for CO ₂ capture
1187	Greener production of carbon nanotubes and battery applications
1189	Production of biodiesel fuels (BDF) from waste edible oils with fluctuating properties using batch-type equipment
1196	Comparative Life Cycle Assessment on the Utilization of Biopolymer-based Biosorbent for Copper Removal in Wastewater Treatment
1197	Centella asiatica L. extract as green corrosion inhibitor for low carbon steel under tropical seawater condition
1206	An Insight into Sustainable Circular Bioeconomy for Farm Management using Black Soldier Fly Larvae (BSFL)
1212	Integrating Aspen Plus and life cycle assessment (LCA) study of photocatalytic, thermocatalytic dry methane reforming and biomass gasification toward syngas generation
1234	Microbial and Enzymatic Degradation for Biohydrogen Production by <i>Bacillus</i> sp. & <i>Cereibacter</i> sp.
1247	Integrated Leaching and Selective Recovery of Cobalt Using an Amino Acid-Based Aqueous Biphasic System from Spent Lithium-ion Batteries
1255	Techno-economic and environmental assessment of ultraviolet crosslinked fish scales gelatin nanofibers for wound healing

WASTE TREATMENT & MANAGEMENT

Paper ID	Title
1101	Extraction of Methyl Phenol in Selangor River using Solid Phase Extraction Technique Coupled with UV-Vis Spectrophotometry
1114	Digitalization for Sustainable Water Management in Petroleum Production and Processing Facilities
1126	Effect of steam and wash treatment on the property of composite made from date palm residue and PLA
1169	Removal of Organic Water Pollutants using Functionalised Graphene Oxide Adsorbents
1170	3D-Printed PEGDA Monolith with Robust Silane-Grafted Chitosan for Enhanced Textile Wastewater Treatment: Response Surface Methodological Approach
1202	Optimizing Viability of Urban-Industrial Wastewater Management Strategies via P-graph
1207	Application of spherical fuzzy analytic hierarchy process (SFAHP) in treatment technology selection for acid mine drainage (AMD)
1236	Potential Application of Silica Aerogel in Treating Methylene Blue in Wastewater

NANOTECHNOLOGY & ADVANCED MATERIALS

Paper ID	Title
1030	Hierarchical Nickel/Iron-Layered Double Hydroxide Ultrathin Nanosheets in Situ Grown on Nanocarbon Networks for Enhanced Oxygen Evolution Reaction
1036	Evaluation of Antifungal Activity of Magnesium Oxide Nanoparticles on <i>Fusarium oxysporum</i>
1049	Fabrication and characterization of PLA/HA scaffold by combined of freeze-drying and particulate leaching method for bone tissue engineering
1051	Electrochemical Characteristics of Solid-state Lithium Metal Batteries Based on PEBAX Electrolyte
1066	Preparation and mechanical properties of a graphite nanosheet/nylon 610 nanocomposite using graphite nanosheets treated with supercritical water
1067	Fabrication and conductivity of a graphite nanosheet/nylon 610 nanocomposite using graphite nanosheets treated with supercritical water
1071	Investigation of Glyphosate Removal from Aqueous Solution by Calcium Peroxide Nanoparticles
1081	Molybdenum containing carbon nanofiber supported palladium catalyst for formic acid electrooxidation reaction
1084	Sub- and supercritical hydrothermal synthesis of Y3Al5O12 nanoparticles doped with rare earth elements
1088	Preparation conditions of Pickering emulsions stabilized by antibacterial silver nanoparticle via ultrasonication
1090	Synthesis of calcium peroxide nanoparticles with starch as biotemplate for the degradation of organic dye in aqueous solution
1093	Preparation of Macroporous Pectin Particles with High Specific Surface Areas and Interconnected Pore Networks for Enhancement of Protein Adsorption Capacity
1097	Investigation of densified spherical and submicron-sized FeNi particles on their magnetic characteristics
1119	A reduced temperature solid oxide fuel cell with nanostructured electrodes
1183	Rational Design and Fabrication of Copper@Polypyrrole Nanowires Aerogels for Piezoresistive Pressure Sensing
1190	Removal of Inhibitor Compounds from Monosaccharides by Nanofiltration using a Thin-Film Nanofibrous Composite Membrane
1225	High-voltage stable solid-state lithium battery based on the nano-conductor imbedded flexible hybrid composite solid electrolyte with hyper-ion conductivity and thermal, mechanical, and adhesive stability
1246	A Universal Strategy For N-Doped 2D Carbon Nanosheets With Sub-Nanometer Micropore For High-Performance Supercapacitor

SUSTAINABLE PALM OIL

Paper ID	Title
1025	Synthesis and characterization of lignin incorporated carboxymethyl cellulose (CMC) films from oil palm lignocellulosic waste
1122	Domestic woodchips and imported PKS for the future of power generation in Japan. A Life Cycle Analysis of Malaysian Palm Kernel-Shells for Biomass-derived Power generation in Japan.
1130	Effect of temperature and time on empty fruit bunches (EFB) and oil palm trunks (OPT) derived hydrochar for biofuel production: A comparison
1158	A comparative analysis on the performances of four different In-ground Lagoon Anaerobic Digester in the treatment of Palm Oil Mill Effluent (POME)
1162	Effects of operational differences in palm oil mills on Palm Oil Mill Effluent (POME) characteristics
1167	OPTIMISATION STRATEGY TO ACHIEVE NET-ZERO IN PALM OIL SECTOR VIA CIRCULAR ECONOMY MODEL
1209	Review on the present state of the palm oil milling process and potential oil extraction rate (OER) enhancement methods
1228	Enhanced sonocatalytic degradation of Congo Red by using oil palm empty fruit bunch-derived cellulose/silver doped on titanium dioxide composite

PROCESS SYSTEMS ENGINEERING (PSE)

Paper ID	Title
1006	Adsorption and Separation of CO ₂ /CH ₄ in Activated Carbon
1010	Optimization of hydrodynamic parameters for CO ₂ absorption in Rotating Packed Bed
1020	Process Integration for Bioenergy Generation
1038	Modeling and simulation of SBR and digester performance using GEKKO
1040	A P-Graph Approach to Water Use Optimization in a Fish Processing Industry through Resource Conservation Networks with Material Interception
1059	Engineering Terephthalic Acid Product from Recycling of PET Bottles Waste for Downstream Operations
1062	Synthesis and optimization of multilevel mixed refrigerant systems using generalized disjunctive programming.
1064	Simulation of CO ₂ capture from flue gas of a power plant by a three-bed nine-step vacuum pressure swing adsorption process
1065	Machine Learning Method for Determining Chemical Vapor Deposition Conditions for Large-area Graphene Growth
1103	Design of Bio-oil/Solvent Blend with Economic Considerations Using Computer Aided Molecular Design
1112	Optimal operating conditions for high quality tomato cultivation in plant factories in hot and humid regions of Asia
1121	OPTIMIZATION OF FED-BATCH BAKER'S YEAST FERMENTATION USING DEEP REINFORCEMENT LEARNING
1133	Numerical simulation of polymer melt flow and solidification in an injection molding filling process
1134	Real-time Data Conditioning for Process Operations: Application to a Spray Dryer
1135	Ensemble machine learning to predict the selectivity from 3D information of π -pocket catalysts
1147	A Techno-Economic Assessment of the Newly Waived Off-grid Areas in the Philippines
1149	USAGE OF BIOMASS GASIFIER FOR DRYING SOAKED PADDY IN A REVERSIBLE AIRFLOW FLATBED DRYER: ARTIFICIAL NEURAL NETWORK MODELING
1159	Design and Simulation of Pressure Retarded Osmosis for Hydroponics Fertigation
1160	Development of Carbon Dioxide and Hydrogen Sulphide Prediction Model for POME Treatment Using Machine Learning
1163	Investigation of the effect of Variable Inlet Guide Valve Drift, Fouling and Erosion on Three shaft Gas Turbine Performance
1180	An Optimal Decarbonisation Policymaking Software Framework Inspired by Process Integration
1184	Economic and correlation analysis of parabolic trough collector (PTC) system in Malaysia, China and United States
1198	AI-CFD Modeling for Chemical Vapor Dispersion in Laboratory
1200	Investigation of Ammonia Water Evaporation Rate via Molecular Dynamics Simulation
1204	Predictive Capability of Artificial Neural Network in n-Butene Skeletal Isomerization over Hierarchical ZSM-35 Zeolite
1214	Simulation and Experimental Validation of Trace Gas Leakage Detection by Acoustic Method
1230	A novel predictive model for the design of fragrant molecules using rough set-based machine learning
1237	Reinforcement Learning Control with Deep Deterministic Policy Gradient Algorithm for Multivariable pH Process
1238	Two-stage Deep Learning Fault Detection and Identification for Vinyl Chloride Monomer Process with Aberrant Measurements
1258	Heat Recovery of Milk Powder Production With Recirculation of Exhaust Air
1260	Drying Characteristics and Energy Efficiency of Heat Pump Dryer for Industrial Electroplating Sludge Drying
1217	Material Selection for Sweet Gas Production Pipeline: Application of Analytic Hierarchy Process and Failure Mode and Effects Analysis
1218	Application of INVS DEMATEL in Health, Safety, Environment, and Ergonomic Assessment of Tire Manufacturing Industry During COVID-19 Pandemic

REACTION ENGINEERING & CATALYST (1)

Paper ID	Title
1024	Design of Single-Atom and Frustrated-Lewis-Pair Dual Active Sites for Direct Conversion of CH ₄ and CO ₂ to Acetic Acid
1026	Effect of Rb promoter on Fe ₃ O ₄ microsphere catalyst for CO ₂ hydrogenation to light olefins
1027	The state of Pt active phase and its surrounding environment during dehydrogenation of ethane to ethylene
1028	An active and stable nickel-based catalyst with embedment structure for CO ₂ methanation
1029	Homogeneous and highly dispersed Ni-Ru on a silica support as an effective CO methanation catalyst
1034	Activity and stability of unsupported and supported aluminum catalyst for lactic acid esterification with 1-butanol
1037	Honeycomb Tubular Biochar Derived from Palm Leaves as a Potential Adsorbent for VOCs Removal
1041	Synthesis and Characterization of Diethylene Glycol Dioleate as Biolubricant Base
1053	Impact of Tryptophan on the formation kinetics of carbon dioxide hydrates for hydrate-desalination
1054	Recovery of high concentration of amino acids by subcritical water treatment of residuals from vinegar production
1056	Non-catalytic esterification of palm fatty acid distillate with 2-ethyl hexanol for high purity production of biolubricant ester
1057	Recyclable Positive Azeotropes for the Purification of Curcumin with Optimum Purity and Solvent Capacity
1058	Effects of Scale-Up and Impeller Types on Spherical Agglomeration of Dimethyl Fumarate
1060	Unconventional Separation of Arsenic Trioxide from Unused Aqueous Chemotherapeutic Agents by Direct Evaporative Crystallization
1061	Hydrothermal Synthesis of Gallium-based Spinel Oxide Nanoparticles with Different Metal Ion Composition Ratios
1068	Coil-shaped rotating spiral gas-solid reactor - design procedure for catalytic reaction -
1070	DETERMINATION THE EXTENT OF ACID AND BASIC CONDITION DEGRADE LDPE AS COMPATIBILIZER IN LDPE KENAF COMPOSITE
1073	Degradation behaviors of SOFC by the deposition of potassium compounds on the anode surface
1074	ADDITION OF 3-AMINOPROPYLTRIETHOXYSILANE AS AN ADDITIVE IN IMPROVING QUALITY OF LATEX GLOVE
1078	Effects of Temperature and Gas Partial Pressure on Chemical Vapor Deposition Process of Bismuth-based Perovskite Thin Film
1080	Graphene-based catalysis for conversion of marine-based feedstocks under microwave irradiation
1082	Glycerol conversion to GTBE using graphene oxide under microwave irradiation
1086	Effect of supercooling phenomenon on liquid freezing in cylindrical vessel
1087	Design and Techno-Economic Analysis of Levulinic Acid Production Process from Biomass by Using Co-product Formic Acid as a Catalyst with Minimal Waste Generation
1091	Reduction of various metal ions by low-grade carbonaceous resources at a low temperature for chemical energy conversion
1094	Ultra-deep denitrogenation of model fuel by oxidation over sulfated geopolymer catalyst followed by extraction with water
1095	Study of the oxidation reaction of dibenzothiophene with sulfated geopolymer catalyst
1096	Gas-phase Oxidation of Benzene over Cu Catalyst Loaded on MFI Type Molding Zeolite
1098	Design of an iron, cobalt, and nitrogen co-doped carbon catalyst for enhanced high oxygen reduction reaction performance derived from metal-organic framework and conducting polymer complexes
1099	Synthesis of Co ₉ S ₈ @NC Hollow Nanocages from composite of Metal-Organic Framework and polypyrrole and their application for water splitting
1102	Comparative study on the oxidation of manganese ions by sodium hypochlorite and potassium permanganate under low pH conditions
1104	A Highly Stable W-doped TiO ₂ Supported Pt Electrocatalyst for Oxygen Reduction Reaction in Acidic Media
1105	Synthesis of Low-Pt-Based Electrocatalyst Derived from Porous MOF-808(Zr)-NH ₂ Nanoparticles Towards Oxygen Reduction Reaction
1107	Torrefaction of Olive Jift Biomass with Low Density Polyethylene (LDPE) Plastics and Their Interactive Effects
1108	Spray pyrolysis-assisted synthesis of Ruthenium doped MoO ₂ sphere for high mass activity of hydrogen evolution reactions over a wide pH range

REACTION ENGINEERING & CATALYST (2)

Paper ID	Title
1111	Synthesis of MOF-808/PEBAX mixed-matrix membranes for CO ₂ /N ₂ separation with different sizes of MOFs
1113	Carbon dioxide absorption effect on electric conductivities for aqueous solution of 2-aminoethanol, 2-(methylamino)ethanol, and 2-(butylamino)ethanol at 313.2 K
1115	Spray Pyrolysis-Derived Hollow CoFe-NC@CNT Electrocatalyst with Improved Stability and Activity for Oxygen Reduction Reaction
1116	Spray pyrolysis-derived atomically dispersed hollow spherical bimetallic(Co, Fe) electrocatalysts with improved stability for Oxygen Reduction reaction in acidic media
1120	Low-loading platinum alloy electrocatalyst supported on hollow carbon for the four-electron oxygen reduction reaction
1127	TECHNO-ECONOMIC COMPARISON OF DIFFERENT REACTOR TYPES USED IN THE MANUFACTURE OF FRUCTOOLIGOSACCHARIDES FROM SUCROSE
1132	Effect of Polymer Addition on Dynamic Leidenfrost Phenomenon
1138	Continuous separation of submicrometer-sized particles using microfluidic devices integrated with porous substrate as sieving matrices
1139	Risk assessment of nickel compounds based on Daphnia magna assay
1140	Carbon Dioxide Recovery from Air by a Conductively Heated and Cooled Temperature Swing Adsorption Packed with an Amine based Solid Adsorbent
1141	Electrochemical cell design and performance evaluation of polyvinyl ferrocene/carbon nanotube electrodes for selective formate separation
1150	Effect of anode catalyst layer improvement on mass transport and performance of Direct Formic Acid Fuel Cell
1164	Development of a novel Cu-based dual function material for CO ₂ Capture and Hydrogenation
1165	Rhodium Promoted Bimetallic Dual Functional Material for Integrated Co ₂ Capture and Conversion
1168	Application of Graphene Oxide-Silica Xerogel for the Continuous Removal of Crystal Violet Dye
1173	Development of novel method for selective conversion of dibutyl phosphate into phosphoric acid with the vapor-phase pulsed discharges
1176	Kinetic modelling of hydrogen peroxide concentration dosed to degrade sulphamethoxazole by UV/H ₂ O ₂
1178	Complete removal of CO at ambient conditions using copper manganese oxide (CuMnOx) catalysts synthesised via co-precipitation with ultrasonic irradiation
1185	Study on High Temperature Hydrothermal Resistant Mn-Based Catalysts for Catalytic Oxidation of Ethyl Acetate
1194	Rational design of the Ni catalyst for low temperature benzene hydroalkylation
1195	Parametric studies on DME carbonylation to MA in a fluidized bed reactor
1199	EFFECT OF TWO-POT HEAT TREATMENT ON FE-N-C/TI ₃ C ₂ TOWARDS THE OXYGEN REDUCTION REACTION FOR FUEL CELL APPLICATION
1205	Effect of pH on changes in color during sulphamethoxazole oxidation by UV/H ₂ O ₂
1210	Modulating of non-noble metal semiconductors for solar/electro-to-chemical conversion: Bridging atomic-level insights with experimental analysis
1211	Surface active-site engineering of N-rich carbon nitride allotropes for catalytic H ₂ production in acidic and alkaline media
1215	Microwave-Assisted Catalyst- and Additive-Free Multicomponent Synthesis of Diverse Bipyridines and their Heavy Metal Sensing Properties using Biorenewable and Safe Dipolar Aprotic Solvent
1240	Formation of NO _x for Metal Dissolution in Nitric Acid
1241	Approaching Practically Accessible and Environmentally Adaptive Sodium Metal Batteries with High Loading Cathodes through In-Situ Interlock Interface
1242	Fabrication and modification of high performance sulfonated aromatic polymer membrane for pervaporation desalination
1243	A Graphene-Coated Thermal Conductive Separator to Eliminate the Dendrite-Induced Local Hotspots for Stable Lithium Cycling
1244	Packing sulfur species by phosphorene-derived catalytic interface for electrolyte-lean lithium-sulfur batteries
1245	Confinement of Pt NPs by Hollow-Porous-Carbon-Sphere via Pore Regulation with Promoted Activity and Durability in Hydrogen Evolution Reaction
1251	Zwitterionic Covalent Organic Frameworks: Attractive Porous Host for Gas Separation and Anhydrous Proton Conduction

SDG Special Symposium



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Scan the **QR Code** to join the zoom session.

(Refer attached programme for info)

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