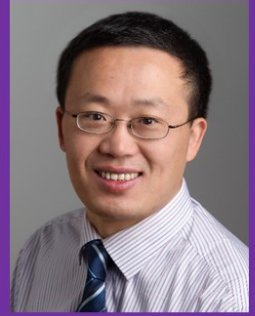




The 3rd International Conference on Carbon Capture Science and Technology (CCST 2024)

Online: July 20-22, 2024 (China Time, GMT+8)

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The 3rd International Conference on Carbon Capture Science and Technology (CCST 2024)

July 20-22, 2024 (China Time, GMT+8)

Conference Theme: CCST 2024 Plenary & Session A

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Conference Theme: CCST 2024 Session B

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Day One (20th July 2024, China Time (GMT+8))		
China Time (GMT+8)	<u>Open Ceremony & Awards</u>	
8:30-8:50		
8:50-9:30	<u>PL-1 (Chair: Shouliang Yi)</u> <u>Selective Solid 'Molecular Basket' Sorbents for CO₂ Capture and for SO₂ Separation</u> <u>Prof. Chunshan Song</u> <u>The Chinese University of Hong Kong</u>	
9:30-10:10	<u>PL-2 (Chair: Hui Zhou)</u> <u>Research on Flue Gas Chemical Absorption Technology and Demonstration</u> <u>Prof. Mengxiang Fang</u> <u>Zhejiang University</u>	
10:10-10:20	Breaks	
	Parallel Session 1A	Parallel Session 1B
	Chairs: Changlei Qin, Yongqing Xu, Chee Loong Teo	Chairs: Shijian Lu, Shuzhuang Sun, Masroor Abro
10:20-10:45	KA-1	KB-1
10:45-11:00	OA-1	OB-1
11:00-11:15	OA-2	OB-2
11:15-11:30	OA-3	OB-3
11:30-11:45	OA-4	OB-4
11:45-12:00	OA-5	OB-5
12:00-13:30	Lunch	
13:30-14:10	<u>PL-3 (Chair: Guoping Hu)</u> <u>Plasma Assisted Catalytic Carbon Reduction</u> <u>Prof. Ying Zheng</u> <u>University of Western Ontario, Canada</u>	
	Parallel Session 2A	Parallel Session 2B
	Chairs: Long Jiang, Faizan Ahmad, Fatih Gulec	Chairs: Wai Fen Yong, Zhongde Dai, Mehmood Ali
14:10-14:35	KA-2	KB-2
14:35-15:00	KA-3	KB-3
15:00-15:15	OA-6	OB-6
15:15-15:30	OA-7	OB-7
15:30-15:40	Breaks	
15:40-15:55	OA-8	OB-8
15:55-16:10	OA-9	OB-9
16:10-16:25	OA-10	OB-10
16:25-16:40	OA-11	OB-11
16:40-16:55	OA-12	OB-12
16:55-17:10	OA-13	OB-13
17:10-17:25	OA-14	OB-14
17:25-17:40	OA-15	OB-15
17:40-21:00	Dinner	

21:00-21:40	<u>PL-4 (Chair: Haiping Lin)</u> <u>Ion Solubility, Diffusivity, and Transport in Charged Polymer Membranes</u> <u>Prof. Benny Freeman</u> <u>The University of Texas at Austin, USA</u>	
Day Two (21st July 2024, China Time (GMT+8))		
China Time		
8:30-9:10	<u>PL-5 (Chair: Paul Liu)</u> <u>Creating a New Circular Carbon Economy via Carbon Capture, Utilization and Storage</u> <u>Prof. Ah-Hyung “Alissa” Park</u> <u>University of California, Los Angeles, USA</u>	
	Parallel Session 3A	Parallel Session 3B
	Chairs: Bo Jin, Hui Zhou, Huan Wang	Chairs: Bishnupada Mandal, Bangda Wang, Chong Liu
9:10-9:35	Award Session	KB-4
9:35-10:00		KB-5
10:00-10:15		OB-16
10:15-10:25		Breaks
10:25-10:40		OB-17
10:40-10:55		OB-18
10:55-11:10		OB-19
11:10-11:25		OB-20
11:25-11:40		OB-21
11:40-13:30	Lunch	
13:30-14:10	<u>PL-6 (Chair: Daxin Liang)</u> <u>Design of Carbon Capture Membranes Based on Membrane Processes Investigation</u> <u>Prof. Zhi Wang</u> <u>Tianjin University, China</u>	
14:10-14:50	<u>PL-7 (Chair: Yeshui Zhang)</u> <u>Development of Electrocatalysts for Electrochemical Reduction of Carbon Dioxide to Value-added Chemicals</u> <u>Prof. Guoqing Guan</u> <u>Hirosaki University, Japan</u>	
	Parallel Session 4A	Parallel Session 4B
	Chairs: Shuzhuang Sun, Xiangkun Cao, Lisa Sun	Chairs: Dongdong Feng, Xin He, Xin Xiao
14:50-15:15	KA-4	KB-6
15:15-15:40	KA-5	KB-7
15:40-15:50	Breaks	
15:50-16:05	OA-16	OB-22
16:05-16:20	OA-17	OB-23
16:20-16:35	OA-18	OB-24
16:35-16:50	OA-19	OB-25

	Breaks	
16:50-17:05	OA-20	OB-26
17:05-17:20	OA-21	OB-27
17:20-17:35	OA-22	OB-28

Day Three (22nd July 2024, China Time (GMT+8))		
China Time		
8:30-9:10	<u>PL-8 (Chair: Zhongde Dai)</u> <u>Pre-Combustion Carbon Capture by Carbon-Dioxide Permselective Membrane Reactor – Process Design and Cost Analysis</u> <u>Prof. Jerry Y.S. Lin</u> <u>(Arizona State University, USA)</u>	
9:10-9:50	<u>PL-9 (Chair: Yujie Ban)</u> <u>Let's Get Practical and Make Useful Membranes</u> <u>Prof. Haiping Lin</u> <u>University at Buffalo, The State University at New York, Buffalo</u>	
	Parallel Session 5A	Parallel Session 5B
	Chairs: Muhammad Shafique, Yongzhuo Liu, Zhuonan Song	Chairs: Lina Liu, Rizwan Nasir
9:50-10:15	KA-6	KB-8
10:15-10:30	OA-23	OB-29
10:30-10:40	Breaks	
10:40-10:55	OA-24	OB-30
10:55-11:10	OA-25	OB-31
11:10-11:25	OA-26	OB-32
11:25-11:40	OA-27	OB-33
11:40-11:55	OA-28	KB-9
11:55-12:10	OA-29	
12:10-13:30	Lunch	
	Parallel Session 6A	
	Chairs: Runsheng Lin, Meng Wang, Jinmei Xu	
13:30-13:55	KA-7	
13:55-14:10	OA-30	
14:10-14:25	OA-31	
14:25-14:40	OA-32	
14:40-15:05	KA-8	
15:05-15:30	KA-9	
15:30-15:55	KA-10	
15:55-16:05	Breaks	

16:05-16:45	<u>PL-10 (Chair: Yikai Xu)</u> <u>High temperature integrated CO₂ capture and utilisation</u> <u>Dr Chunfei Wu</u> <u>Queen's University Belfast, UK</u>
16:45-17:20	<u>Closing Ceremony and Awards</u>

Day One (20th July 2024, China Time (GMT+8))

Day One – Parallel Session A

Topic: capture with solid sorbents

Beijing Time: 10:20-18:10

([Link of meeting room](#)) ([Link of koushare](#))

Beijing Time (GMT+8)		Open Ceremony & Awards	
8:30-8:50			
8:50-9:30		PL-1 (Chair: Shouliang Yi) Selective Solid ‘Molecular Basket’ Sorbents for CO ₂ Capture and for SO ₂ Separation Prof. Chunshan Song The Chinese University of Hong Kong	
9:30-10:10		PL-2 (Chair: Hui Zhou) Research on Flue Gas Chemical Absorption Technology and Demonstration Prof. Mengxiang Fang Zhejiang University	
10:10-10:20		Breaks	
Session 1A: Theme 2. Carbon capture with solid sorbents Chair: Changlei Qin, Yongqing Xu, Chee Loong Teo			
China Time		Speaker	Title
10:20-10:45	KA-1	Hai Yu CSIRO	CO ₂ capture at CSIRO
10:45:11:00	OA-1	Changqing Wang Huazhong University of Science and Technology	High-Entropy Fluorite Oxide (Ce _{0.2} La _{0.2} Nd _{0.2} Yb _{0.2} Zr _{0.2})O ₂ : Enhancing CaO-Based Sorbent Performance for High-Temperature CO ₂ Capture
11:00-11:15	OA-2	Haiyan Mao Stanford University	Scalable Nanoporous Networks for Carbon Capture via Solid-state NMR Spectroscopy
11:15-11:30	OA-3	Yongtie Cai Nanyang Technological University	Design and operation of a pilot-scale dual fluidized bed cold model for calcium looping

11:30-11:45	OA-4	Hong Zhu Xiangtan University	A highly effective and low-cost sepiolite-based solid amine adsorbent for CO ₂ capture in post-combustion
11:45-13:30	Lunch		
PL-3 Chair: Guoping Hu			
13:30-14:10	PL-3	Prof. Ying Zheng University of Western Ontario, Canada	Plasma Assisted Catalytic Carbon Reduction
Session 2A: Carbon capture with solid sorbents Chair: Long Jiang, Faizan Ahmad, Fatih Gulec			
14:10-14:35	KA-2	Yanfang Fan China University of Petroleum (Beijing)	Amine modified porous polymer/silica spiral wound module for CO ₂ capture from ambient air
14:35-15:00	KA-3	Cher Hon (Sam) Lau University of Edinburgh	Developing hypercrosslinked polymers with quasi-unimodal micropores for carbon capture
15:00-15:15	OA-6	Made Ganesh Darmayanti Monash University	Carbon Dioxide Capture by Novel Ionic Covalent Organic Polymers (iCOPs)
15:15-15:30	OA-7	Huizhe Wu Huazhong University of Science and Technology	Study on the Particle Performance of Vehicle mounted Solid Adsorbent with Organic Pore Forming Agent
15:30-15:40	Breaks		
15:40-15:55	OA-8	Kaiwen Ma Nanjing Normal University	Aluminum-Enhanced Ca-Based CO ₂ Sorbents: Core-Shell Assembly and the Impact of Stabilizer Precursor
15:55-16:10	OA-9	Qi Huang University of Edinburgh	Photo-responsive porous materials for Low energy CO ₂ capture and conversion
16:10-16:25	OA-10	Tong Luo Huazhong University of Science and Technology	Nano-sized spherical CaO-based CO ₂ sorbents prepared by spray combustion synthesis

16:25-16:40	OA-11	Zang Pengchao Shandong University	Two-dimensional interfacial enhanced CO ₂ adsorption performance of porous organic amine solids: Structure-activity relationships and DFT calculations
16:40-16:55	OA-12	Wei Liu Zhejiang University	Dynamic characteristic analysis of coal-fired power plant coupled with carbon capture
16:55-17:10	OA-13	Emmanuel Dan University of Aberdeen	Household mixed plastic waste derived adsorbents for CO ₂ capture: A feasibility study
17:10-17:25	OA-14	Xiaotong Zhao Queens university of belfast	Enhanced CO ₂ capture and reverse water gas shift reaction using CaO in NaCl-CaCl ₂ molten salt medium
17:25-17:40	OA-15	Shi Zhaowei Huazhong University of Technology	A modified pore structure model for the calcination stage of the calcium looping
17:40-21:00	Dinner		
PL-4 Chair: Haiqing Lin			
21:00-21:40	PL-4	Prof. Benny Freeman The University of Texas at Austin, USA	Ion Solubility, Diffusivity, and Transport in Charged Polymer Membranes

Day One (20th July 2024, China Time (GMT+8))

Day One – Parallel Session B

Topic: capture with liquid sorbents & Carbon capture with membranes

China Time: 10:20-18:10

([Link of meeting room](#)) ([Link of koushare](#))

China Time (GMT+8)			
8:30-8:50		Open Ceremony & Awards	
8:50-9:30		PL-1 (Chair: Shouliang Yi) Selective Solid ‘Molecular Basket’ Sorbents for CO₂ Capture and for SO₂ Separation Prof. Chunshan Song The Chinese University of Hong Kong	
9:30-10:10		PL-2 (Chair: Hui Zhou) Research on Flue Gas Chemical Absorption Technology and Demonstration Prof. Mengxiang Fang Zhejiang University	
10:10-10:20		Breaks	
Session 1B: Carbon capture with liquid solvents Chairs: Shijian Lu, Shuzhuang Sun, Masroor Abro			
China Time		Speaker	Title
10:20-10:45	KB-1	Teng Zhou Hong Kong University of Science and Technology	AI-driven Integrated Material and Process Design for Efficient CO ₂ Capture
10:45-11:00	OB-1	Zhang Wei Harbin Institute of Technology	Research on life cycle carbon emission accounting of sucrose based on a new ammonia carbon capture approach
11:00-11:15	OB-2	Yang Xiatong North China Electric Power University	Design of Polyamino Organic Amine Phase Change Absorbents and Carbon Capture Performance
11:15-11:30	OB-3	Zhipeng Chen Zhejiang University	Research of novel polyamine-based biphasic absorbents for CO ₂ capture using alkanolamine to regulate the viscosity and mechanism analysis
11:30-11:45	OB-4	Wufeng Jiang Huazhong University of Science and Technology	Study on the regeneration performance of ILs-based liquid-solid biphasic absorbent for CO ₂ capture

11:45-12:00	OB-5	Chen Guangjie UCSI University, Malaysia	Promising Amine-Amine-Sulfolane Ternary Biphasic Absorbent for CO ₂ Capture: Gas-liquid-liquid equilibrium characteristics, regenerative energy consumption and mass transfer kinetics
12:00-13:30	Lunch		
PL-3 Chair: Guoping Hu			
13:30-14:10	PL-3	Prof. Ying Zheng University of Western Ontario, Canada	Plasma Assisted Catalytic Carbon Reduction
Session 2B: Carbon capture with membranes Chairs: Wai Fen Yong, Zhongde Dai, Mehmood Ali			
14:10-14:35	KB-2	Zhongde Dai Sichuan University	Microstructure rearranged block copolymer based membranes for CO ₂ separation
14:35-15:00	KB-3	Jianqiang Meng Tiangong University	A tough double-network ion gel membrane based on Poly (ionic liquid) for efficient carbon capture
15:00-15:15	OB-6	Lau Hui Shen Xiamen University Malaysia	Delving into the intrinsic microstructure of polymers of intrinsic microporosity (PIMs) membranes for carbon capture
15:15-15:30	OB-7	Leiqing Hu University at Buffalo	Few-Cycle Atomic Layer Deposition to Nanoengineer Polymeric Materials for Gas Separations
15:30-15:40	Breaks		
15:40-15:55	OB-8	Yanxiao Hei China university of petroleum (Beijing)	CO ₂ Capture on 2D Carbon-Nitrogen Nanosheets: Utilizing Charge, Electric Field, and Strain Engineering for Enhanced Separation
15:55-16:10	OB-9	Tan Gao Changsha University of Science & Technology	Piperazine silica adsorbent for capture of CO ₂ in NGCC and DAC and its oxidation mechanism

16:10-16:25	OB-10	Hong Xu University of South Africa	Direct air carbon capture using hydrophobic MOFs: A large-scale simulation study
16:25-16:40	OB-11	Ying Ji Zhejiang University	The influence and mechanism of positive ion on the adsorption capacity of moisture-swing DAC sorbents
16:40-16:55	OB-12	Yuhang Liu Shanghai Jiao Tong University	Solar Curtailment Powered Flexible Direct Air Capture
16:55-17:10	OB-13	Sheng Chen Zhejiang University	A comparative numerical analysis of parallel membranes and pellets contactor for direct air capture
17:10-17:25	OB-14	Yongxian Long Changsha University of Science & Technology	CO ₂ capture of Boron/Nitrogen co-doped biomass carbon
17:25-17:40	OB-15	Renyu Xie Zhejiang University	Analysis on cycle performance of moisture swing adsorption for direct air capture using membrane technology
17:40-21:00	Dinner		
PL-4 Chair: Haiqing Lin			
21:00-21:40	PL-4	Prof. Benny Freeman The University of Texas at Austin, USA	Ion Solubility, Diffusivity, and Transport in Charged Polymer Membranes

Day Two (21st July 2024, China Time (GMT+8))

Day Two – Parallel Session A

Topic: Award Session & capture with solid sorbents

China Time: 9:10-17:35

([Link of meeting room](#)) ([Link of koushare](#))

China Time		Plenary Session 5	
8:30-9:10		PL-5 (Chair: Paul Liu) Creating a New Circular Carbon Economy via Carbon Capture, Utilization and Storage Prof. Ah-Hyung “Alissa” Park University of California, Los Angeles, USA	
Session 3A: Award Session Chairs: Bo Jin, Hui Zhou, Huan Wang			
China Time		Speaker	Title
9:10-9:40	AW-1	Waheed Afzal University of Aberdeen	Low-Carbon Strategies for Converting Mixed Waste Plastics into Valuable
9:40-10:10	AW-2	Song Zhao Tianjin University	Gas separation membranes assembled by porous organic cages for CO ₂ capture
10:10-10:40	AW-3	Lingzhi Wang East China University of Science & Technology	Photocatalytic Conversion of Methane to Ethanol at a Three-Phase Interface with Concentration-Matched Hydroxyl and Methyl Radicals
10:40-10:50	Breaks		
10:50-11:20	AW-4	Cong Luo Huazhong University of Science and Technology	High Efficient Calcium Looping Sorbent for Post-Combustion CO ₂ Capture
11:20-11:50	AW-5	Yaxuan Jing Nanjing University	Catalytic conversion of waste plastics through C-O/C-C activation
11:50-12:20	AW-6	Xian Suo Zhejiang University	Functionalized porous polymers for carbon capture and structurally-related gas separation
12:20-13:30	Lunch		

<u>Chair: Daxin Liang, Yeshui Zhang (Parallel Session A, B)</u>			
13:30-14:10	PL-6	Prof. Zhi Wang Tianjin University, China	<u>Design of Carbon Capture Membranes Based on Membrane Processes Investigation</u>
14:10-14:50	PL-7	Prof. Guoqing Guan Hirosaki University, Japan	<u>Development of Electrocatalysts for Electrochemical Reduction of Carbon Dioxide to Value-added Chemicals</u>
<u>Session 4A: Integrated carbon capture and utilization</u> <u>Chairs: Shuzhuang Sun, Xiangkun Cao, Lisa Sun</u>			
14:50-15:15	KA-4	Bo Jin (Hunan University)	Application of chemical looping CO ₂ capture and in-situ conversion for upgrading flue gas resource utilization from heavy emission industry
15:15-15:40	KA-5	Mingzhe (Lisa) Sun (Surface Measurement Systems)	Influence of humidity on the sorption of CO, in prototypical porous materials: insights and challenges
15:40-15:50	Breaks		
15:50-16:05	OA-16	Shuzhuang Sun Zhengzhou University	Integrated CO ₂ capture and utilization: A novel process with new scientific question
16:05-16:20	OA-17	Daocheng Liu Southeast University	Dual Function Materials towards efficient CO ₂ capture and in-situ methanation at low-temperature
16:20-16:35	OA-18	Zhouzhou Zhang Nanjing Normal University	Integrated CO ₂ capture and conversion performance of Ni-CaO dual functional materials pellets in O ₂ -containing flue gas stream
16:35-16:50	OA-19	Ziqi Tang Changsha University of Science & Technology	Nitrogen/Oxygen co-doped carbon adsorbent for CO ₂ capture from humid flue gas: an experimental and DFT study
Break			

17:05-17:20	OA-20	Zhixin Huang Tianjin university	Integration of plastic recycling and CCUS: Life cycle assessment of a novel strategy for plastic sustainable transition and negative emissions
17:20-17:35	OA-21	Siyi Wei Huazhong University of Science and Technology	CO₂ assisted ethane dehydrogenation over Cr-loaded ZrO₂-modified γ-Al₂O₃ catalyst: Effect of ZrO₂ modification
17:35-17:50	OA-22	Xinzheng Wei Nanjing Normal University	Investigation of NiCo-HAP catalyzed methane dry reforming under photo- assisted thermal conditions

Day Two (21st July 2024, China Time (GMT+8))

Day Two – Parallel Session B

Topic: Carbon capture, utilization, and storage
& Biomass utilization and carbon removal

China Time: 9:10-17:35

([Link of meeting room](#)) ([Link of koushare](#))

China Time	Plenary Session 5		
8:30-9:10	PL-5 (Chair: Paul Liu) Creating a New Circular Carbon Economy via Carbon Capture, Utilization and Storage Prof. Ah-Hyung “Alissa” Park University of California, Los Angeles, USA		
Session 3B: Carbon capture, utilization, and storage Chairs: Bishnupada Mandal, Bangda Wang, Chong Liu			
China Time		Speaker	Title
9:10-9:35	KB-4	Hongman Sun China University of Petroleum (East China)	Rational Design of Ag@CuOx Tandem Catalysts for Boosted Electrochemical CO ₂ Reduction
9:35-10:00	KB-5	Kangkang Li Peking University	Reaction enthalpy recovery to advance amine based CO ₂ capture technology
10:00-10:15	OB-16	Jude Okolie University of Oklahoma	Decarbonising bioenergy through biomass utilisation in chemical looping combustion and gasification
10:15-10:25	Breaks		
10:25-10:40	OB-17	JiaWei Zhong South China Agricultural University	Bi-reforming of methane to syngas over highly active and stable nano-catalysts
10:40-10:55	OB-18	Yufei Xiao China University of Petroleum(Beijing)	Construction and performance control of supercritical CO ₂ microemulsion system

10:55-11:10	OB-19	Shuai Yan Huazhong University of Science and Technology	The unexpected solar hydrocarbon production from photothermal CO ₂ hydrogenation over CoFeZn catalyst: The synergy between K promoter and photochemistry
11:10-11:25	OB-20	Yi-Sheng Wang Kangwon National University	Regenerated coral waste used for carbon sequestration in cement-based materials
11:25-11:40	OB-21	YANG BO Kangwon National University	Effect of waste oyster shell powder on the micro- and macro properties and sustainable performance of cement-based materials
11:40-13:30	Lunch		
Chair: Daxin Liang, Yeshui Zhang (Parallel Session A, B)			
13:30-14:10	PL-6	Prof. Zhi Wang Tianjin University, China	Design of Carbon Capture Membranes Based on Membrane Processes Investigation
14:10-14:50	PL-7	Prof. Guoqing Guan Hirosaki University, Japan	Development of Electrocatalysts for Electrochemical Reduction of Carbon Dioxide to Value-added Chemicals
Session 4B: Biomass utilization and carbon removal Chairs: Dongdong Feng, Xin He, Xin Xiao			
14:50-15:15	KB-6	Claudia Martin Fernandez University of Aberdeen	Sustainable materials and greener processes for carbon capture by means of adsorption
15:15-15:30	OB-22	Dongpei Zhang China University of Petroleum (East China)	Pt Induced O ₂ --W ₆ + Electronic Transfer at Pt-WO _x Interface for Enhanced C-O Cleavage of Glycerol to 1,3-Propanediol
15:30-15:50	Breaks		
15:50-16:05	OB-23	Guanhua Liu Hebei University of Technology	Electroenzymatic CO ₂ reduction
16:05-16:20	OB-24	Dong Heming Harbin Institute of Technology	Novel trans-critical compressed carbon dioxide thermal and electrical co-storage system based on adsorbent

16:20-16:35	OB-25	Mengyuan Liu China University of Petroleum	Study on Oxidation of Glucose to Tartaric Acid over Pt Based Catalysts
16:35-16:50	OB-26	Shengkai Liu Northeast Forestry University	Bioinspired Innovation: alginate-enhanced iron-doped titanium-based lithium-ion sieves@NaCMC aerogels - a leap forward in adsorption and sustainability
16:50-17:05	Break		
17:05-17:20	OB-27	Zhang Quanxing China University of Petroleum	Efficient Catalyst Design for Green Synthesis of Bio-based Glutaric Acid
17:20-17:35	OB-28	Daofeng Mei Instituto de Carboquímica, Spanish National Research Council (ICB-CSIC)	Syngas generation from microalgae through chemical looping gasification— primary results from an EU Marie-Curie project
17:35-17:50	KB-7	Haresh Manyar Queen's University Belfast	Catalysis and Process Engineering for CO ₂ Refineries

Day Three (22nd July 2024, China Time (GMT+8))

Day Three – Parallel Session A

Topic: Carbon Neutral for Construction Materials (CCCM)

China Time: 9:50-15:30

([Link of meeting room](#)) ([Link of koushare](#))

Plenary Session: PL-8 (Chair: Zhongde Dai); PL-9 (Chair: Yujie Ban)			
China Time		Speaker	Title
8:30-9:10	PL-8	Prof. Jerry Y.S. Lin Arizona State University, USA	Pre-Combustion Carbon Capture by Carbon-Dioxide Permselective Membrane Reactor – Process Design and Cost Analysis
9:10-9:50	PL9	Prof. Haiqing Lin University at Buffalo, The State University at New York, USA	Let's Get Practical and Make Useful Membranes
Session 5A: Carbon Neutral for Construction Materials (CCCM) Chairs: Muhammad Shafique, Yongzhao Liu, Zhuonan Song			
China Time		Speaker	Title
9:50-10:15	KA-6	Wai Fen Yong Xiamen University Malaysia	Developing Polymeric Membranes for Carbon Capture with Greener Approaches
10:15-10:30	OA-23	Junli Liu Purdue University	Low carbon-intensive biolubricants production from lipids
10:30-10:40		Breaks	
10:40-10:55	OA-24	Runkai Chen Guangdong University of Technology	Integration between indirect CO ₂ hydrogenation and coal-to-methanol industry: A case study of low CO ₂ emission methanol production
10:55-11:10	OA-25	Godknows Dziva Institute of Process Engineering, Chinese Academy of Sciences	Small-scale ammonia production via sorption-enhanced gasification of biomass
11:10-11:25	OA-26	Meng, Li-Yi Kangwon National University	Exploring the Synergistic Effects of Aluminum Sulfate as an Eco-Friendly Early

			Strength Agent on Cement-Based Materials for Carbon Neutrality
11:25-11:40	OA-27	Han Yi Kangwon National University	Improving the performance of alkali-activated materials using dry ice as an innovative, environmentally-friendly additive
11:40-11:55	OA-28	Jinmei Xu Chinese Academy of Forestry	Research on Carbon Emission Reduction of Industrialized High Value Utilization of Deep Water Plant Reed
11:55-12:10	OA-29	Xiao Feng Dalian University of Technology	Defect Engineered Metal-Organic Frameworks for Gas Separation
12:10-13:30	Lunch		
Session 6A: CO₂ capture, utilization and storage Chairs: Runsheng Lin, Meng Wang, Jinmei Xu			
13:30-13:55	KA-7	Xiaoyong Wang Kangwon National University	The mixture design method of concrete with low carbon and high fly ash content
13:55-14:10	OA-30	Fatih Gulec The University of Nottingham	How Metal Oxide Preparation Methods Transform Chemical Looping Applications?
14:10-14:25	OA-31	Sadiq Abubakar Coventry University, UK	Enhancing CO ₂ Storage Capacity Estimation in North Sea Saline Aquifers Using a Geo-Spatially Aware Machine Learning Algorithm
14:25-14:40	OA-32	Tianheng Qin University of Aberdeen	Pyrolysis-catalytic gasification of plastic waste for hydrogen-rich syngas production with hybrid-functional Ni-CaO-Ca ₂ SiO ₄ catalyst
14:40-15:05	KA-8	Zhun Hu Xi'an Jiaotong University, China	Amine-grafted on doped modified SBA-15 for direct air capture
15:05-15:30	KA-9	Prabhu Azhagapillai Abu Dhabi National Oil Company, United Arab Emirates	Materials Screening for CO ₂ Adsorption: Enhancing Environmental Sustainability
15:30-15:55	KA-10	Ioanna (Yanna) Dimitriou University of Nottingham	TBC

15:55-16:05	Breaks
16:05-16:45	PL-10 (Chair: Yikai Xu) High temperature integrated CO₂ capture and utilisation Dr Chunfei Wu Queen's University Belfast, UK
16:45-17:20	Closing Ceremony and Awards

Day Three (22nd July 2024, China Time (GMT+8))

Day Three – Parallel Session B

Topic: CO₂ utilization and storage

China Time: 9:50-15:30

(Link of meeting room) (Link of koushare)

Plenary Session: PL-8 (Chair: Zhongde Dai); PL-9 (Chair: Yujie Ban)			
China Time		Speaker	Title
8:30-9:10	PL-8	Prof. Jerry Y.S. Lin Arizona State University, USA	Pre-Combustion Carbon Capture by Carbon-Dioxide Permselective Membrane Reactor – Process Design and Cost Analysis
9:10-9:50	PL9	Prof. Haiqing Lin University at Buffalo, The State University at New York, USA	Let's Get Practical and Make Useful Membranes
Session 5B: CO ₂ utilization and storage Chairs: Lina Liu, Rizwan Nasir			
China Time		Speaker	Title
9:50-10:15	KB-8	Kangkang Li Peking University	Reaction enthalpy recovery to advance amine based CO ₂ capture technology
10:15-10:30	OB-29	Miao Lu Zhejiang University	Upcycling MSWI fly ash into green binders via wet carbonation
10:30-10:40	Breaks		
10:40-10:55	OB-30	Xiaoyi Gao Huazhong University of Science and Technology	Construction of prediction equations for organic amine biphasic absorption systems based on phase separation loadings
10:55-11:10	OB-31	Han Zhang Huazhong University of Science and Technology	Mechanism study on the enhancement effect of phosphorous additives on biochar stability
11:10-11:25	OB-32	Huang Yan Zhejiang University	Exploration of energy-efficient technology for post combustion carbon capture integrated with mechanical vapor recompression

11:25-11:40	OB-33	Soosan Kim	Effect of moisture on CO ₂ enhanced desorption process
11:40-12:05	KB-9	Xin Jin	China University of Petroleum, Qingdao
12:05-16:05	Breaks		
16:05-16:45	PL-10 (Chair: Yikai Xu) High temperature integrated CO₂ capture and utilisation Dr Chunfei Wu Queen's University Belfast, UK		
16:45-17:20	Closing Ceremony and Awards		

Plenary Speakers

PL-1 Prof. Chunshan SONG, The Chinese University of Hong Kong

Title: High-capacity Selective Solid ‘Molecular Basket’ Sorbents for CO₂ Capture and for SO₂ Separation



Prof. Chunshan Song is the Dean of Science and Wei Lun Professor of Chemistry at the Chinese University of Hong Kong since July 2020. He is leading the Faculty of Science at CUHK including 6 major units (chemistry, physics, mathematics, statistics, life science, earth and environmental science) and several research institutes with ~600 faculty and staff offering 20 undergraduate programs with ~2700 BSc students and 21 postgraduate programs with ~1100 PhD, MPhil and MSc students. He is a Distinguished Professor Emeritus in Fuel Science and Chemical Engineering at the Pennsylvania State University, USA where he was the Director of EMS Energy Institute and founding Director of the University Coalition for Fossil Energy Research funded by US DOE. With BSc in Chemical Engineering from Dalian University of Technology and Ph.D. in Applied Chemistry from Osaka University, his research focuses on catalysis and chemistry of energy and fuels including CO₂ capture, catalytic CO₂ conversion, shape-selective catalysis and synthesis and applications of nanoporous materials. He has ~500 refereed journal articles, 8 patents, 16 edited books, 35 book chapters and has delivered over 425 invited lectures worldwide. He has received George A. Olah Award and Henry H. Storch Award from American Chemical Society (ACS), ACS Fellow, Distinguished Researcher Award from ACS Energy & Fuels Division, Outstanding Achievement from the Chinese American Chemical Society (CACS) and Distinguished Fulbright Scholar from US-UK, Herman Pines Award from Chicago Catalysis Club and Excellence in Catalysis Award from Catalysis Club of Philadelphia. Within Penn State, he has received the Faculty Scholar Medal, University Distinguished Professor, Wilson Award for Excellence in Research, Faculty Mentoring Award, and Materials Science and Engineering Service Award. He is an advisory editor for Journal of CO₂ Utilization (Elsevier), Associate Editor for Frontiers of Chemical Science and Engineering (Springer) and served on the editorial board of 14 research journals in catalysis, chemistry, energy and fuels, and chemical engineering. He also held Visiting or Guest or Adjunct Professorship at Imperial College London, University of Paris VI, Tsinghua

University, Tianjin University, Dalian University of Technology, Dalian Institute of Chemical Physics, and Taiyuan University of Technology.

PL-2 Prof. Mengxiang Fang, Zhejiang University

Title: Research on Flue Gas Chemical Absorption Technology and Demonstration



Prof. Mengxiang Fang got his PhD degree on Engineering Thermophysics from Zhejiang University in 1991. After graduated, he worked at Institute for Thermal Power Engineering of Zhejiang University and was promoted to the professor in 1998. His research is coal and biomass combustion, pyrolysis and gasification, CO₂ chemical absorption and oxy-fuel combustion. He has already been responsible to finished more than 40 projects including National Natural Science Foundation Project, National Key Basic Research Project (973), National High Technology Research and Development Project(863), EU project, etc. He got more than 20 patents and presented more than 100 papers in Journal and conference.

PL-3 Prof. Ying Zheng, University of Western Ontario, Canada

Title: Plasma Assisted Catalytic Carbon Reduction



Prof. Zheng is a professor and a Canada Research Chair (Tier I) in Chemical Reaction and Intensification with the Department of Chemical Engineering, Western University. She is a Fellow of the Canadian Academy of Engineering, the Engineering Institute of Canada, and the Chemical Institute of Canada as well as a Fellow of the Royal Society of chemistry (UK) and the Institution of Chemical Engineers (UK). Her research interests lie in the field of catalysis and catalytic processes for clean energy innovations. New catalytic materials along with catalytic processes are developed for application in CO₂ utilization, N₂ fixation, H₂ production and clean/biofuel upgrading.

She is an enthusiastic teacher and have trained many graduate students and post-doctoral fellows. Professor Zheng also actively serves the Chemical Engineering Society, serving as the Chair of

the Catalysis Division of the Chemical Institute of Canada (2018-2020), as a member of journal editorial boards and grant selection committees, and as editors and guest editors of various scientific journals. She has received numerous awards, including the 2018 Applied Catalysis Awards (the Royal Society of Chemistry, UK), the Award in Design and Industrial Practice in 2018, and the 2010 Syncrude Canada Innovation Award.

PL-4 Prof. Benny Freeman, The University of Texas at Austin, USA

Title: Ion Solubility, Diffusivity, and Transport in Charged Polymer Membranes



Prof. Benny Freeman is the William J. (Bill) Murray, Jr. Endowed Chair in Engineering at The University of Texas at Austin and is Professorial Fellow at Monash University. He is a professor of Chemical Engineering and has been a faculty member for 34 years. Dr. Freeman's research is in polymer science and engineering and, more specifically, in mass transport of small molecules in solid polymers. He currently directs 17 Ph.D. students and postdoctoral fellows performing fundamental research in gas and liquid separations using polymer and polymer-based membranes. His research group focuses on discovery of structure/property relations for desalination and gas separation membrane materials, new materials for hydrogen

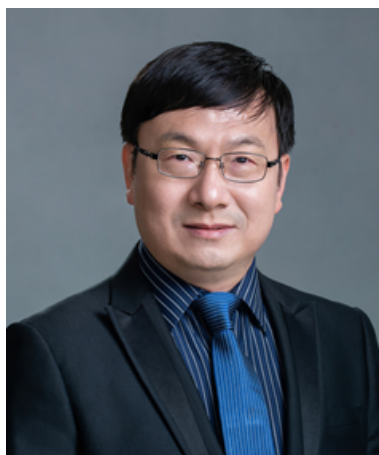
separation, natural gas purification, carbon capture, and new materials for improving fouling resistance, permeation, and separation performance in liquid separation membranes. He is Director of the Center for Materials for Water and Energy Systems (M-WET), a Department of Energy EFRC (Energy Frontier Research Center).

His research is described in more than 500 publications and 24 US and international patents. He has co-edited 5 books on these topics. His research has served as the basis for several startup companies, including EnergyX and NALA Systems. He has won numerous awards, including the AIChE Materials Engineering & Sciences Division Braskem Award for Excellence in Materials Science and Engineering, the ACS Award in Applied Polymer Science, and the American Institute of Chemical Engineers (AIChE) Institute Award for Excellence in Industrial Gases Technology. He is a Fellow of the AIChE, ACS, North American Membrane Society, AAAS, PMSE, POLY, and IECR divisions of ACS. He is a member of the U.S. National Academy of Engineering and the Texas Academy of Medicine, Engineering, Science & Technology.

PL-5 Prof. Ah-Hyung “Alissa” Park, University of California, Los Angeles, USA**Title: Creating a New Circular Carbon Economy via Carbon Capture, Utilization and Storage**

A.-H. “Alissa” Park is the Ronald and Valerie Sugar Dean of UCLA Samueli School of Engineering and a Professor of Chemical and Biomolecular Engineering at the University of California, Los Angeles. Before joining UCLA in 2023, she was the Lenfest Earth Institute Professor of Climate Change at Columbia University, where she also served as the Director of the Lenfest Center for Sustainable Energy. Her research focuses on sustainable energy and materials conversion pathways with an emphasis on integrated Carbon Capture, Utilization and Storage (CCUS) technologies. Park received a number

of professional awards and honors, including the Shell Thomas Baron Award in Fluid-Particle Systems and PSRI Lectureship Award from AIChE PTF, U.S. C3E Research Award, and NSF CAREER Award. She also led key global and national discussions on CCUS, including the Mission Innovation Workshop in 2017. Park is a Fellow of AIChE, ACS, RSC and AAAS.

PL-6 Prof. Zhi Wang, Tianjin University, China**Title: Design of Carbon Capture Membranes Based on Membrane Processes Investigation**

Wang Zhi is a chair professor of Tianjin university. He is also the director of the Tianjin Key Laboratory of Membrane Science and Desalination Technology and the director of State Key Laboratory of Chemical Engineering (Tianjin University). His major research interests include membrane materials, membrane processes, gas separation, and water treatment. Throughout the years, notable recognition includes being awarded the "Tianjin Municipal Natural Science First Prize" in 2004 and 2021, being recognized as an "Excellent Talent of the New Century" by the Ministry of Education in 2006, achieving the "National Teaching

Achievement Award First Prize" in 2009 and the "National Teaching Achievement Award Second Prize" in 2022. Professor Wang has hosted more than 50 research projects, including 4 National Natural Science Foundation Key Projects of China, one National Marine Public Welfare Research Project of China, and one National Key Research and Development Project of China. His research achievements have been published in high-impact journals such as Nature Materials, Advanced Materials, Angewandte Chemie International Edition, Journal of the American Chemical Society, AIChE Journal, and Journal of Membrane Science, with about 300 SCI papers and more than 11,000 citations.

PL-7 Prof. Guoqing Guan, Hirosaki University, Japan**Title: Development of Electrocatalysts for Electrochemical Reduction of Carbon Dioxide to Value-added Chemicals**

Dr Guoqing Guan is a full professor of Hirosaki University, Japan. He received his B.S., M.S. and Ph.D degrees in Chemical Engineering from Sichuan University, China and Kyushu University, Japan, in 1990, 1993, 1995 and 2004. His research interests include sustainable energy system, coal and biomass pyrolysis and gasification, biorefinery, heterogeneous catalysts for energy conversion, energy materials, CO₂ reduction and water splitting for hydrogen production. He has published over 450 international peer reviewed papers, 60 patents and 23 book chapters with a H-index 66. He is now serving as associate

editors of Carbon Resources Conversion and MetalMat; editorial board members of Fuel Processing Technology and Resources Chemicals and Materials.

PL-8 Prof. Jerry Y.S. Lin, Arizona State University, USA

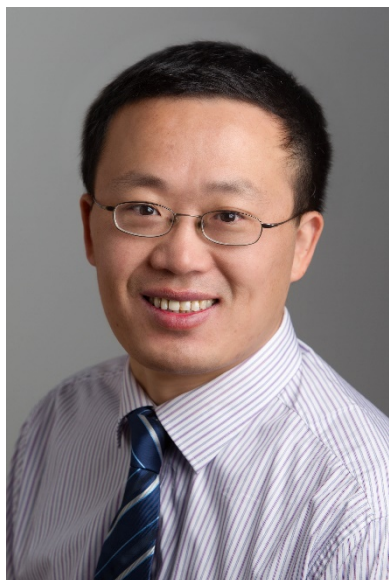
Title: Pre-Combustion Carbon Capture by Carbon-Dioxide Permselective Membrane Reactor – Process Design and Cost Analysis



Jerry Y.S. Lin is a Regents' Professor at Arizona State University. He was department chair of chemical engineering at ASU from 2006-2009 after his 13-year appointment as a faculty member at University of Cincinnati. Dr. Lin's main research areas are membrane science, adsorption/catalysis, and energy storage. He has published about 400 papers mostly in chemical engineering journals, and is an inventor of 9 US and European patents, and was listed as one of most cited authors in the field of chemical engineering. Dr. Lin received several awards including AIChE Institute Award for Excellence in Industrial Gas Technologies in 2009 and AIChE Gerhold Award in 2021. He is an elected fellow of American Society for Advancement of Science (AAAS), American Institute of Chemical Engineers (AIChE) and North American Membrane Society (NAMS). Dr. Lin was an Editor of Journal of Membrane Science for 12 years, and is currently the co-Editor-in-Chief of Journal of Membrane Science and JMS Letters.

PL-9 Prof. Haiqing Lin, University at Buffalo, The State University at New York, USA

Title: Let's Get Practical and Make Useful Membranes



Dr. Haiqing Lin received his Ph.D. in Chemical Engineering from the University of Texas at Austin in 2005 and then joined Membrane Technology and Research, Inc. (MTR) as a Senior Research Scientist. He led projects on natural gas clean-up and CO₂/H₂ separation membranes (such as Polaris™ membranes). Dr. Lin joined University at Buffalo (UB) as an assistant professor in 2013 and was promoted to professor in 2021. His research focuses on advanced polymeric membranes for gas separations (such as carbon capture) and membranes for water purification (such as surface modification and 2D materials). He has published more than 130 peer-reviewed articles and book chapters, and he is a co-inventor of 10 US patents and patent

applications. He was a recipient of the NSF CAREER award in 2016, the Innovation Award from the AIChE Separation Division in 2020, and SUNY Chancellor's Award for Excellence in Scholarship and Creative Activities in 2022.

PL-10 Dr Chunfei Wu, Queen's University Belfast

Title: High temperature integrated CO₂ capture and utilisation



Dr Chunfei Wu is a Reader at the School of Chemistry and Chemical Engineering. He has worked in the areas of converting renewable and waste resources to energy, fuel, and chemicals through catalytic thermochemical routes for 20 years. He is the PI of a EU RISE international exchange programme in relation to biomass gasification and carbon capture and utilisation (Ref; EU823745, €864,400) (2019-2022), coordinating 15 research groups. Dr Wu has also been involved in several EPSRC, Innovate

UK, Royal Society and other EU projects. For example, he is the Co-I in EP/R000670/1 using microwave for bio-oil upgrading; Co-I in Innovate UK (Ref: 29478) for advanced battery thermal control and thermal using thermal phase change materials; Host academic for a Royal Society K.C. Wong International Fellowship (Ref: NIF\R1\191817). He has published >220 peer-reviewed journal papers with >10,000 citations (H index of 62, Google Scholar). He is the Managing Editor of Biomass and

Bioenergy, and he is a Chartered Scientist and a Member of Royal Society of Chemistry. He is also the Founding Editor-in-Chief of Carbon Capture Science & Technology, a journal published by Elsevier. Dr Wu is also the Chair of International Association for Carbon Capture.

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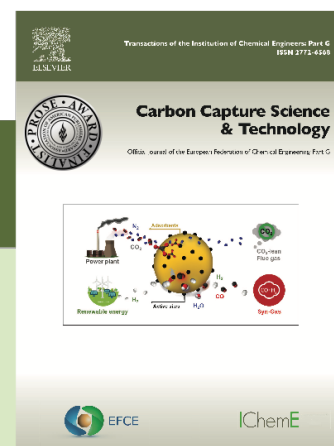


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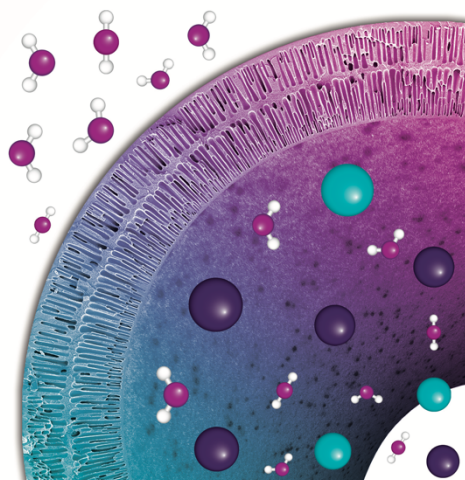


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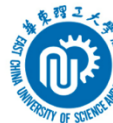
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