

SPRING SYMPOSIUM 2018

 **LG화학**

TORAY
도레이첨단소재

 **GS칼텍스**

 **롯데케미칼**

 **SK이노베이션**

 **LG하우시스**



April 25 (Wed) ~ 27 (Fri)
CECO, CHANGWON



대한화학공학회
THE KOREAN INSTITUTE OF CHEMICAL ENGINEERS

SINCE 1962

“Chemical Engineering for Clean Energy and Environment”



Woo-Sik Kim
President

In recent years, environmental regulations have become intensified all around the world to diminish climate changes caused by the burning of fossil fuel. Scientific research and industrial developments for clean energy systems have become critical issues. Also, the techniques for the reduction of particulate matter emitted from various industrial activities have attracted great interest.


Over the past 50 years, the Korean Institute of Chemical Engineers (KICHE) has been continuously trying to demonstrate the technical perspectives and leading the way in the chemical engineering society through cooperation with academia, institutes, and industries. To satisfy the social need for the clean environment and renewable energy, KICHE will devote much of its efforts to improving the conference quality and close cooperation with industrial and international partners.

I am pleased to announce that the 2018 Spring General Meeting and Conference will be held under the theme of “Chemical Engineering for Clean Energy and Environment” in Changwon, a frontier-city among Korean industrial complexes. The conference will include regular scientific program, a series of special symposiums on energy and environment, and symposiums on a particular theme organized by Division Committees. Also, several new programs will be introduced such as “Chem-Tech-Biz Symposium” for the successful commercialization of industrial companies, “Basic Research Education Session” for graduate students and “Meet the Young Researcher Poster Session” for young researchers.


Members and staffs of KICHE have prepared the 2018 Spring General Meeting and Conference with sincere and continuous efforts for the creative innovations. I hope such changes will become the driving force for the development of KICHE. I wish to encourage scientists, engineers, and students in the field of Chemical Engineering to participate the symposium and enjoy the new program.

Plenary Talk / Basic Research Education Session / Keynote Lecture






Plenary Talk

Name / Affiliation		Short Bio.	Topic
	Jinwon Lee Professor, Chemical and Biomolecular Engineering Sogang Univ. / Director, C1 Gas Refinery R&D Center	1993 Ph.D. in Chemical Engineering, Carnegie Mellon Univ. 1994 Researcher, Univ. of Virginia 2005 Professor, Chemical Engineering, Kwangwoon Univ.	C1 Gas Conversion Technology

Basic Research Education Session

Name / Affiliation		Short Bio.	Topic
	Hyungsun Kim Professor, School of Materials Engineering, Inha Univ. / President, Korean Council of Science Editors	1989 Ph.D. in Materials Engineering, Imperial College London 2008 Metal and Materials International Editor 2010 How to Write Correctly Scientific Papers? SNU Press	How to Write Correctly Scientific Papers

Keynote Lecture

Name / Affiliation		Session	Topic
	Junguk Choi LG Chemical	(Special Symposium) 2018 Chem-Tech-Biz Symposium: Successful commercialization case and its process of domestic research and development for chemical catalyst	Commercialization of high value added innovative catalyst and process development
	Sehyun Shin Korea Univ.	(Symposium on Biochemical Engineering) Symposium on the innovation and future of <i>in vitro</i> diagnostic chip	Development of liquid biopsy technology for precision medicine
	Jae Sung Lee UNIST	(Symposium on Catalysis and Reaction Engineering) Frontiers in next-generation catalysis symposium	Solar hydrogen: Current status and prospect
	Wonyong Choi POSTECH	(Symposium on Catalysis and Reaction Engineering) Frontiers in next-generation catalysis symposium	Photofunctional catalysts for solar energy utilization and conversion
	Yung-Eun Sung Seoul Nat'l Univ.	(Symposium on Catalysis and Reaction Engineering) Frontiers in next-generation catalysis symposium	Next-generation electrocatalyst design for energy devices

2018 KIChE Spring Meeting Time Schedule 1

April 25(Wed.): CECO

13:00~17:00	Onsite Registration
13:00~16:50	Tutorial: Basics of molecular modeling and simulation(3F 301)
13:00~18:30	Tutorial: Introduction to chemical process design(3F 302)

April 25(Wed.): Pullman Ambassador Changwon 2F 'Grand Ballroom'

15:30~16:30	Chair Meeting of Operational Committees/Regional Sections/Divisions
16:00~17:50	Young Researcher Workshop
16:30~17:00	Councilor Registration
17:00~17:50	Councilor Meeting
18:00~20:00	Councilor Dinner(Joined by Young Researcher)

April 26(Thu.): CECO

	Room A (Convention Hall II)	Room B (Convention Hall III)	Room C (301)	Room D (302)	Room E (601)	Room F (602)	Room G (603)	Room H (604)	Room I (605)	Room J (606)	Room K (607)	Room L (600A)	Room M (600B)
08:00~18:00	Pre Registration(Lifetime/Annual MemberA-100,000Won, Annual MemberB-150,000Won(Annual fee(1yr) waived), Student MemberA- 40,000Won, Student MemberB-70,000Won(Annual fee(1yr) waived), Nonmember: 150,000Won) Onsite Registration(Lifetime/Annual MemberA-110,000Won, Annual MemberB-160,000Won(Annual fee(1yr) waived), Student MemberA- 45,000Won, Student MemberB-75,000Won(Annual fee(1yr) waived), Nonmember: 160,000Won)												
	Registration(Doughnuts & Coffee Service)												
08:30~11:00		Basic Research Education Session (09:00~11:00)	Polymer Oral Presentation I (09:00~11:00)	Energy and Environment Oral Presentation I (Student Oral) (08:20~11:00)			Thermodynamics Oral Presentation (09:00~10:30)	[Women's Initiatives Committee] Women Chemical Engineer's Networking Meeting (09:30~11:00)	[Symposium by the Division 1] Symposium on the functional coatings technology (08:30~11:00) Industrial Chemistry	Process Systems Engineering Oral Presentation I (Student Oral) (08:30~11:00)		Materials Oral Presentation I (Student Oral) (08:30~11:00)	Catalysis and Reaction Engineering Oral Presentation I (08:30~11:00)
11:00~11:10	Coffee Break												
11:10~12:00	Plenary Talk: C1 Gas Conversion Technology [Jinwon Lee, Chemical and Biomolecular Engineering, Sogang Univ. / C1 Gas Refinery R&D Center] (Room A (Convention Hall II))												
12:00~14:00	General Assembly(Room A(Convention Hall II), Reception(Convention Hall I), (Attendees: Only for regular members pre-registered for General Assembly)												
14:00~17:40	[Symposium by the Division 2] Symposium on applications of molecular simulation in new and renewable energy fields (14:00~16:50) Thermodynamics	[Special Symposium 1] 2018 Chem- Tech-Biz Symposium: Successful com- mercialization case and its process of domestic research and development for chemical catalyst (14:00~17:40)	[Special Symposium 2] Symposium on polymeric materials for next generation energy technology (14:00~17:30) Polymer	Energy and Environment [Special Symposium 3] Electrochemical and chemical storage of renewable energy symposium (14:00~17:40)	Fine Particles Technology Oral Presentation (14:00~15:40) Fine Particles Technology	[Symposium by the Division 3] Symposium on separation technologies for C1 chemistry (14:00~17:10) Separation Technology	Fluidization Oral Presentation (14:00~16:20) Fluidization	[Symposium by the Division 4] Intelligent safety software in the era of Industry 4.0 symposium (14:00~17:20) Process Safety	Transport Phenomena Oral Presentation (14:00~16:20) Transport Phenomena	Process Systems Engineering Oral Presentation II (14:00~17:30) Process Systems Engineering	[Symposium by the Division 5] Symposium on the innovation and future of <i>in vivo</i> diagnostic chip (14:00~17:00) Biochemical Engineering	Materials Oral Presentation II (14:00~16:50) Materials	Catalysis and Reaction Engineering Oral Presentation II (14:00~17:00) Catalysis and Reaction Engineering
17:40~18:00	Free Gift by Lot(3F Exhibition Hall I)												
3F Exhibition Hall 1	Poster Posting I (09:00~11:00): Polymer, Separation Technology, Biochemical Engineering												
	Poster Posting II (16:00~17:40): Industrial Chemistry, Fine Particles Technology, Energy and Environment												
	Promotion & Exhibition												

2018 KIChE Spring Meeting Time Schedule **2**

April 26(Thu.): Pullman Ambassador Changwon 2F 'Grand Ballroom A'

The 6th CEO Forum(Attendees: Pre Registration CEO Club Members)		
16:00~16:20	Registration and welcome	Young Seop Kim(Vice President of Industry Affairs of KIChE)
16:20~16:30	Opening remarks	Jang Soo Oh(Chairperson of CEO Club)
16:30~18:00	Mega-Change of Energy, Chemical, and 4th Industrial Revolution	Jiwoo Shon(Senior Analyst of SK Securities Research Center)
18:00~18:10	Celebratory photography	
18:10~20:00	Banquet	

April 27(Fri.): CECO

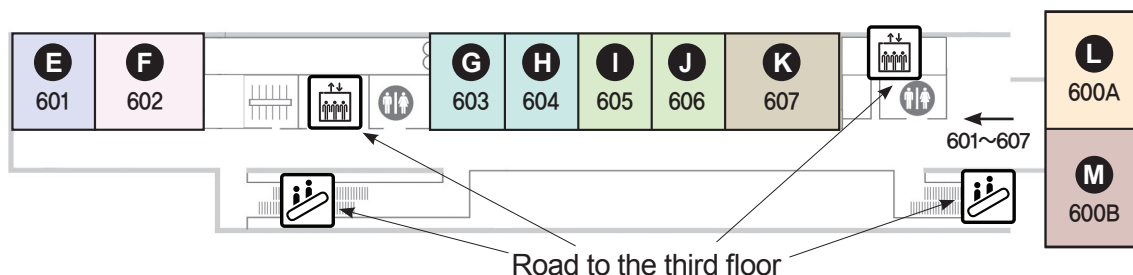
	Room B (Convention Hall III)	Room C (301)	Room D (302)	Room E (601)	Room F (602)	Room G (603)	Room H (604)	Room I (605)	Room J (606)	Room K (607)	Room L (600A)	Room M (600B)
08:00~16:30	Registration(Doughnuts & Coffee Service)											
09:00~12:00	[Special Symposium 4] Symposium on direct non-oxidative conversion of methane (09:00~12:00)	KIChE young investigators symposium I (09:00~11:40)	Meet the Young Researcher Poster Session (10:00~12:00)	Polymer Oral Presentation II (09:00~12:05)	[Symposium by the Division 6] International symposium on the fluidized beds and multi-phase flow reactors (09:30~12:00)	Separation Technology Oral Presentation (09:00~12:00)	Processe Safety Oral Presentation (09:00~12:00)	Energy and Environment Oral Presentation II (09:00~11:40)	[Symposium by the Division 7] Symposium on applications of fine particles in energy and environment (09:00~11:30)	Biochemical Engineering Oral Presentation I (Student Oral) (09:00~11:00)	[Symposium by the Division 8] Symposium on fine dust reducing technology and material (09:00~12:00)	[Symposium by the Division 9] Frontiers in next-generation catalysis symposium (09:10~11:50)
12:00~13:00	Lunch											
13:00~16:00		KIChE young investigators symposium II (14:00~16:00)								Biochemical Engineering Oral Presentation II (13:00~16:00)	Materials Oral Presentation III (13:00~15:20)	[Symposium by the Division 9] Frontiers in next-generation catalysis symposium (13:30~15:40)
16:00~16:30	Closing ceremony(Free Gift by Lot and Awards) (3F Exhibition Hall 1)											
3F Exhibition Hall I	Poster Posting III (09:00~11:00): Process Systems Engineering, Materials											
	Poster Posting IV (13:00~15:00): Thermodynamics, Fluidization, Transport Phenomena, Catalysis and Reaction Engineering, Processe Safety											
	Promotion & Exhibition											

Division General Meeting Time Schedule (April 26(Thu.))

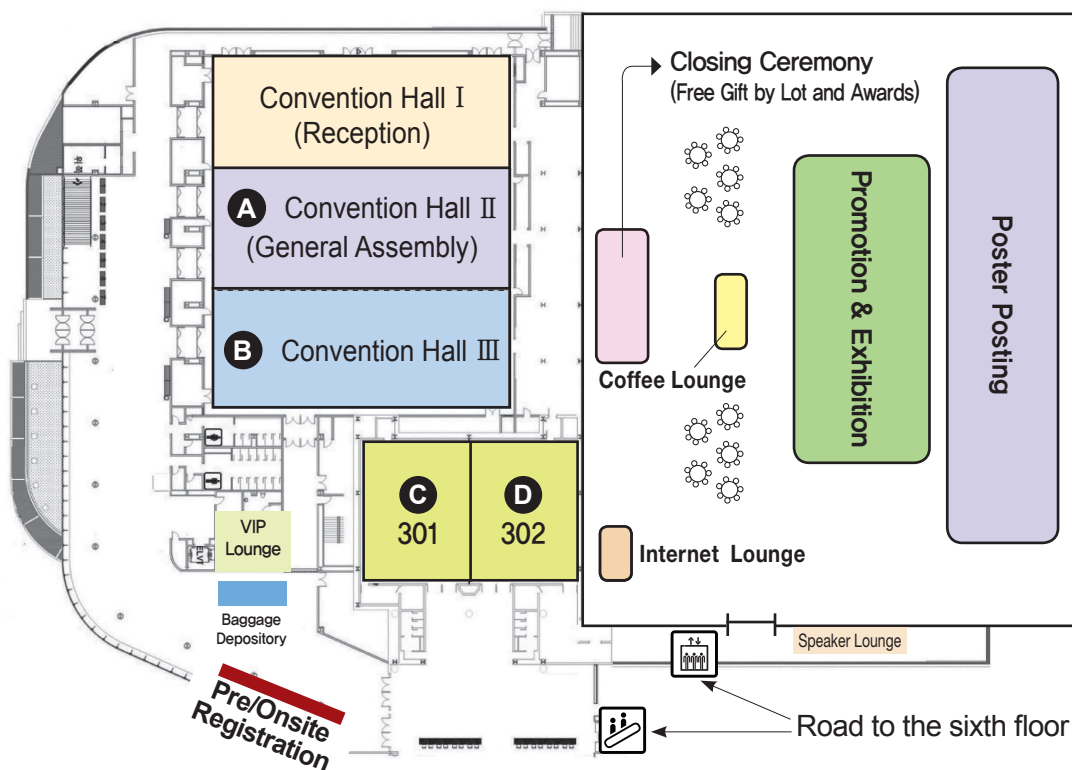
Division of Polymer	Room C (301)	17:30~17:50
Division of Industrial Chemistry	Room I (605)	11:00~11:10
Division of Process Systems Engineering	Room J (606)	17:30~17:50
Division of Fine Particles Technology	Room E (601)	15:40~16:10
Division of Separation Technology	Room F (602)	17:10~17:40
Division of Biochemical Engineering	Room K (607)	17:00~17:30
Division of Energy and Environment	Room D (302)	13:30~14:00
Division of Thermodynamics	Room A (Convention Hall II)	16:50~17:20
Division of Fluidization	Room G (603)	16:20~16:50
Division of Transport Phenomena	Room I (605)	16:20~16:50
Division of Materials	Room L (600A)	16:50~17:20
Division of Catalysis and Reaction Engineering	Room M (600B)	17:00~17:30
Division of Processe Safety	Room H (604)	17:20~17:30

Facility Introduction by CECO

6F



3F



- Plenary Talk·General Assembly: Room A(3F Convention Hall II), Reception(3F Convention Hall I)
- Pre/Onsite Registration, Baggage Depository: 3F Lobby
- Symposium-Oral Presentation: Room A~D(3F), Room E~M(6F)
- Poster Posting, Coffee Lounge, Closing Ceremony, Promotion & Exhibition, Internet Lounge: 3F Exhibition Hall 1
- VIP Lounge: 3F
- Speaker Lounge: 3F Entrance to the Exhibition Hall 1

** Free wireless access at the convention center*

2018 Chem–Tech–Biz Symposium: Successful commercialization case and its process of domestic research and development for chemical catalyst

Co-host: Industry-Academia-Government Partnership Committee,
Division of Catalysis and Reaction Engineering

CECO Room B(Convention Hall III)

April 26(Thu.) 2018, 14:00~17:40

Chairman: **Woo Kyoung Kim**, Yeungnam Univ.
Eun Woo Shin, Univ. of Ulsan

14:00	[Keynote Lecture] Commercialization of high value added innovative catalyst and process development	Junguk Choi , LG Chemical
14:30	Hydrocarbon management in SK innovation	Seung Hoon Oh , SK Innovation
15:00	Naphtha catalytic cracking for production of light olefins	Yong-Ki Park , KRICT
15:30	Development and commercialization of propane dehydrogenation catalyst	Young Gyo Choi , Hyosung
16:00	Coffee break	
16:10	Dehydrogenation of C3~C13 paraffins over Pt-Sn/Alumina catalyst	Young San Yoo , HEESUNG CATALYSTS CORP.
16:40	KIER SponCat technology for Fischer-Tropsch synthesis and its potential application	Dong Hyun Chun , KIER
17:10	Commercialization process and field applications of environmental catalyst	Heakyung Park , Hanseo Univ.

Speaker



Junguk Choi
LG Chemical



Seung Hoon Oh
SK Innovation



Yong-Ki Park
KRICT



Young Gyo Choi
Hyosung



Young San Yoo
HEESUNG CATALYSTS
CORP.



Dong Hyun Chun
KIER



Heakyung Park
Hanseo Univ.



Oh Shim Joo
KIST

Organizer/Speaker

Organizer

Chairman



Woo Kyoung Kim
Yeungnam Univ.



Eun Woo Shin
Univ. of Ulsan

Symposium on polymeric materials for next generation energy technology

Host: Division of Polymer

CECO Room C(301)

April 26(Thu.) 2018, 14:00~17:30

Chairman: **Pil Jin Yoo**, SKKU

- | | | |
|-------|--|-------------------------------------|
| 14:00 | Advanced materials and devices for the flexible perovskite photovoltaics on polymer substrates | Min Jae Ko , Hanyang Univ. |
| 14:25 | Development of polymer donors and small-molecule acceptors for high-efficiency organic solar cells | In Hwan Jung , Kookmin Univ. |
| 14:50 | Form factor-free, printed rechargeable power sources | Sang-Young Lee , UNIST |
| 15:15 | Interlocking interfaces: Bi-layered membrane for polymer electrolyte fuel cells and redox flow batteries | Hee-Tak Kim , KAIST |

Chairman: **Felix Sunjoo Kim**, Chung-Ang Univ.

- | | | |
|-------|--|-------------------------------------|
| 15:50 | Conjugated polymer films for flexible thermoelectric generator | Eunkyoung Kim , Yonsei Univ. |
| 16:15 | Flexible thermoelectric generators using organic materials by printing process | Song Yun Cho , KRICT |
| 16:40 | Rational design of nanocarbon materials for enhanced thermoelectric performance | Heesuk Kim , KIST |
| 17:05 | Triboelectric nanogenerators based on multifunctional materials for self-powered electronics | Sang-Woo Kim , SKKU |

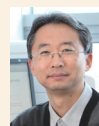
Speaker



Min Jae Ko
Hanyang Univ.



In Hwan Jung
Kookmin Univ.



Sang-Young Lee
UNIST



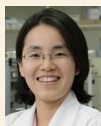
Hee-Tak Kim
KAIST



Eunkyoung Kim
Yonsei Univ.



Song Yun Cho
KRICT



Heesuk Kim
KIST



Sang-Woo Kim
SKKU

Organizer/Chairman



Pil Jin Yoo
SKKU



Felix Sunjoo Kim
Chung-Ang Univ.

Electrochemical and chemical storage of renewable energy symposium

Host: Division of Energy and Environment

CECO Room D(302)

April 26(Thu.) 2018, 14:00~17:40

Chairman: **Moon Sang Jung**, Chungbuk Nat'l Univ.

- | | | |
|-------|--|-----------------------------------|
| 14:00 | Designing redox-stable cobalt-polypyridyl complexes for redox flow batteries | Hye Ryung Byon , KAIST |
| 14:30 | Development of vanadium redox flow battery electrodes for large scale energy storage systems | Hansung Kim , Yonsei Univ. |
| 15:00 | Performance enhancement of felt electrode and electrolyte in vanadium redox flow batteries | Jung Hoon Yang , KIER |
| 15:30 | Coffee break | |

Chairman: **Jun Young Kim**, Kolon Industry

- | | | |
|-------|--|---------------------------------------|
| 15:40 | d-orbital manifold controlled electrocatalyst for solar fuel | Ki Tae Nam , Seoul Nat'l Univ. |
| 16:10 | Small molecules for hydrogen based energy storage systems(H_2 -ESS) | Chang Won Yoon , KIST |
| 16:40 | Atomically thin graphene oxide encapsulation of Mg nanocrystals for safe and high density hydrogen storage | Eun Seon Cho , KAIST |
| 17:10 | Hydrogen production from ammonia via complete electrolytic process | Jaeyoung Lee , GIST |

Speaker



Hye Ryung Byon
KAIST



Hansung Kim
Yonsei Univ.



Jung Hoon Yang
KIER



Ki Tae Nam
Seoul Nat'l Univ.



Chang Won Yoon
KIST

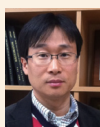


Eun Seon Cho
KAIST

Chairman



Jaeyoung Lee
GIST



Moon Sang Jung
Chungbuk Nat'l Univ.



Jun Young Kim
Kolon Industry

Organizer



Hee-Tak Kim
KAIST



Young-Kwon Park
Univ. of Seoul



Tak Hyoung Lim
KIER

Symposium on direct non-oxidative conversion of methane

Co-host: KICHe, SK Innovation, C1 Gas Refinery R&D Center

Support: SK Innovation

CECO Room A(Convention Hall II)

April 27(Fri.) 2018, 09:00~12:00

Chairman: **Hyunjoo Lee**, KAIST

09:00 Industrial perspectives on methane conversion technology

Seung Hoon Oh, SK Innovation

09:30 Non-oxidative conversion of methane for production of
olefins and aromatics

Yong Tae Kim, KRICT

10:00 Direct catalytic methane conversion into ethylene

Minkee Choi, KAIST

10:30 Membrane separation technology for recovery of high-purity
olefin

Jeong-Hoon Kim, KRICT

11:00 Aromatization of methane over metal-loaded zeolites

Do Heui Kim, Seoul Nat'l Univ.

11:30 Valuable hydrocarbons from methane via catalytic &
noncatalytic ways

Kyoung-Su Ha, Sogang Univ.

Speaker



Seung Hoon Oh
SK Innovation



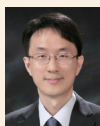
Yong Tae Kim
KRICT



Minkee Choi
KAIST



Jeong-Hoon Kim
KRICT

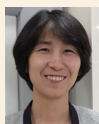


Do Heui Kim
Seoul Nat'l Univ.



Kyoung-Su Ha
Sogang Univ.

Organizer/Chairman



Hyunjoon Lee
KAIST

Symposium on the functional coatings technology

Co-host: Division of Industrial Chemistry, Division of Transport Phenomena

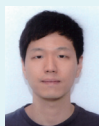
CECO Room I(605)

April 26(Thu.) 2018, 08:30~11:00

Chairman: **Kyung Hyun Ahn**, Seoul Nat'l Univ.

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|-------|---|--|
| 08:30 | Thermal capillary flow in a liquid film coated on a substrate with a geometric pattern | Jaehyun Yoo , Seoul Nat'l Univ. |
| 08:50 | Effect of latex binder on the microstructure and adhesion properties of battery slurry based on capillary suspensions | Ji Eun Park , Seoul Nat'l Univ. |
| 09:10 | Application of image analysis in coating process | Dong Jae Kim , SKKU |
| | | Chairman: Ki Chang Song , Konyang Univ. |
| 09:40 | [Keynote Lecture] Coating materials for next generation display | Young Rae Jang , LG Chemical |
| 10:00 | Influence of material properties on scratch-healing performance of polyacrylate-graft-polyurethane network that undergo thermally reversible crosslinking | Jin Chul Kim , KRICT |
| 10:20 | Eco-friendly surface treatment agent for cold-rolled steel sheet | Byoung Hwa Lee , Daeheung Chemical |
| 10:40 | UV curable functional coatings using polysilazane | Ki Chang Song , Konyang Univ. |

Speaker



Jaehyun Yoo
Seoul Nat'l Univ.



Ji Eun Park
Seoul Nat'l Univ.



Dong Jae Kim
SKKU



Young Rae Jang
LG Chemical



Jin Chul Kim
KRICT



Byoung Hwa Lee
Daeheung Chemical

Organizer/Chairman/Speaker



Ki Chang Song
Konyang Univ.



Kyung Hyun Ahn
Seoul Nat'l Univ.

Organizer/Chairman

Symposium on applications of molecular simulation in new and renewable energy fields

Co-host: Division of Separation Technology, Division of Thermodynamics

CECO Room A(Convention Hall II)

April 26(Thu.) 2018, 14:00~16:50

Chairman: **Sang Kyu Kwak**, UNIST

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|-------|---|--|
| 14:00 | DFT-thermodynamics guided nanomaterials design for highefficiency light energy conversion and advances in manufacturing economy | Heechae Choi , Virtual Lab Inc. |
| 14:30 | High performance computing for nanomaterials and artificial intelligence driven materials data platform | Min Sun Yeom , KISTI |
| 15:00 | Computational materials design for energy and environmental applications | Ki Chul Kim , Konkuk Univ. |
| 15:30 | Coffee break | |
| 15:50 | Fuel cell technology and molecular modeling | Chi Hoon Park , GNTech |
| 16:20 | Development of a general evaluation metric for rapid screening of adsorbent materials for post-combustion CO ₂ capture | Yongchul G. Chung , Pusan Nat'l Univ. |

Speaker



Heechae Choi
Virtual Lab Inc.



Min Sun Yeom
KISTI



Ki Chul Kim
Konkuk Univ.



Chi Hoon Park
GNTech



Yongchul G. Chung
Pusan Nat'l Univ.

Organizer



Yongwon Seo
UNIST



Hun Yong Shin
Seoul Nat'l Univ. of Sci. Tech.

Chairman



Sang Kyu Kwak
UNIST

Symposium on separation technologies for C1 chemistry

Host: Division of Separation Technology

CECO Room F(602)

April 26(Thu.) 2018, 14:00~17:10

Chairman: **Jung-Hyun Lee**, Korea Univ.

14:00	C1 gas separation technology for utilization of carbon resources	Jeong-Hoon Kim , KRICT
14:25	Enabling molecular sieving behaviors of advanced membranes for efficient C1 separations	Jong Suk Lee , Sogang Univ.
14:50	Development of the adsorbent for CO from the off-gases of the Steel Works	Dong Jun Koh , RISTI
15:15	Microstructural optimization of carbon molecular sieve membrane for gas separations	Pyung Soo Lee , Chung-Ang Univ.
15:40	Coffee break	
15:55	Opportunities in Iran's natural gas industry and challenges in natural gas sweetening process	Masoud Mofarahi , Persian Gulf Univ.
16:20	Evaluating performance limits of methane storage /separations of porous materials using artificial neural network	Jihan Kim , KAIST
16:45	PEG-containing surface-attached polymeric separation membranes for carbon dioxide separation	Bong Jun Chang , KRICT

Speaker



Jeong-Hoon Kim
KRICT



Pyung Soo Lee
Chung-Ang Univ.



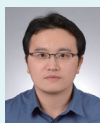
Bong Jun Chang
KRICT



Jong Suk Lee
Sogang Univ.



Masoud Mofarahi
Persian Gulf Univ.



Jung-Hyun Lee
Korea Univ.



Dong Jun Koh
RISTI



Jihan Kim
KAIST



Jong Hak Kim
Yonsei Univ.

Organizer/Chairman

Organizer

Intelligent safety software in the era of Industry 4.0 symposium

Host: Division of Process Systems Engineering

Support: MUSST

CECO Room H(604)

April 26(Thu.) 2018, 14:00~17:20

Chairmen: **Keun Won Lee**, KOSHA

Wonhee Cho, Samsung Engineering

14:00	Opening remarks	Dongil Shin , Chair of KICHe Safety Division
14:10	DNV GL's plant ecosystem to prepare for Industry 4.0	Ky Soo Kim , DNV GL
14:40	Safety enhancement by integrated alarm and operation managemen	JinKyu Yoon , Honeywell Korea
15:10	Risk assessment and artificial intelligence	Soo Hyoung Choi , Chonbuk Nat'l Univ.
15:40	Coffee break	
15:50	Research related to safety software and Industry 4.0 and application tools	Jongmin Kim , UIT Inc.
16:20	Performance standards for safety critical elements and a guide to industrial applications	Wonhee Cho , Samsung Engineering
16:50	Intelligent safety technology and safety systems in the era of Industry 4.0	Dongil Shin , Myongji Univ.

Speaker



Ky Soo Kim
DNV GL



JinKyu Yoon
Honeywell Korea



Soo Hyoung Choi
Chonbuk Nat'l Univ.



Jongmin Kim
UIT Inc.



Organizer/Chairman/Speaker

Wonhee Cho
Samsung Engineering



Organizer/Speaker

Dongil Shin
Myongji Univ.

Chairman



Keun Won Lee
KOSHA

Symposium on the innovation and future of *in vitro* diagnostic chip

Host: Division of Biochemical Engineering
Support: CELAGNOSYS

CECO Room K(607)

April 26(Thu.) 2018, 14:00~17:00

Chairman: **Shin Sik Choi**, Myongji Univ.

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|-------|---|--|
| 14:00 | [Keynote Lecture] Development of liquid biopsy technology for precision medicine | Sehyun Shin , Korea Univ. |
| 14:40 | Biochip for selective isolation of heterogenic circulating tumor cell using magnetic nanoparticle | Bong Seop Kwak , KIMM |
| 15:10 | Coffee break | |
| 15:30 | <i>In vitro</i> diagnosis market trend and biochip based diagnostic test | Jae-Ho Lee , Boditech Med Inc. |
| 16:00 | Surface engineered nanocrystals for lateral flow assay | Jongnam Park , UNIST |
| 16:30 | C. elegans-on-a-chip for diagnosis and detection | Shin Sik Choi ,
Myongji Univ./CELAGNOSYS |

Speaker



Sehyun Shin
Korea Univ.



Bong Seop Kwak
KIMM



Jae-Ho Lee
Boditech Med Inc.

Organizer/Chairman/Speaker



Jongnam Park
UNIST



Shin Sik Choi
Myongji Univ./CELAGNOSYS

International symposium on the fluidized beds and multi-phase flow reactors

Co-host: Division of Fluidization, SKKU Institute of Convergent Chemical Engineering and Technology,
Forum of Multi-phase Flow Reactor Technology

CECO Room F(602)

April 27(Fri.) 2018, 09:30~12:00

Chairman: **Myeongwon Seo**, KIER

- | | | |
|-------|---|--|
| 09:30 | Analysis of interfacial mass transfer rate in microchannels | Ken-Ichiro Sotowa , Tokushima Univ. |
| 10:00 | Ethanol synthesis from syngas via DME carbonylation:
Catalysts and fluidized-bed reactor application | Jong Wook Bae , SKKU |
| 10:30 | Global industrialized strategy from R&D for Hwajin
Cosmetics | Jeageun Lee , Hwajin Cosmetics |
| 11:00 | Thermochemical conversion technology using
liquid metal | Uendo Lee , KITECH |
| 11:30 | Ceremony in honor of professor Jea-Keun Lee | |

Speaker



Ken-Ichiro Sotowa
Tokushima Univ.



Jong Wook Bae
SKKU



Jeageun Lee
Hwajin Cosmetics



Uendo Lee
KITECH



Dong Hyun Lee
SKKU



Chairman

Myeongwon Seo
KIER

Organizer

Symposium on applications of fine particles in energy and environment

Host: Division of Fine Particles Technology

CECO Room J(606)

April 27(Fri.) 2018, 09:00~11:30

Chairman: **Jung Hyeun Kim**, Univ. of Seoul

- | | | |
|-------|---|---|
| 09:00 | Nano composite fabrication for saving energy by dry ball milling process | Heekyu Choi , Changwon Nat'l Univ. |
| 09:30 | Conductive unwoven filter with low pressure drop and high removal efficiency for fine particulate pollutant | Hyemoon Lee , Alink Ltd. |
| 10:00 | Removal of tar(aerosols) by activated carbon in staged gasification processes | Joosik Kim , Univ. of Seoul |
| 10:30 | Particulate matter emissions and advanced high-efficiency LPG engine development | Junghwan Kim , Chung-Ang Univ. |
| 11:00 | Synthesis of 2D/3D graphene based composites by aerosol process for energy materials | Eunhee Cho , Polypia |

Speaker



Heekyu Choi
Changwon Nat'l Univ.



Hyemoon Lee
Alink Ltd.



Joosik Kim
Univ. of Seoul



Junghwan Kim
Chung-Ang Univ.



Eunhee Cho
Polypia



Organizer/Chairman

Jung Hyeun Kim
Univ. of Seoul

Symposium on fine dust reducing technology and material

Host: Division of Materials

CECO Room L(600A)

April 27(Fri.) 2018, 09:00~12:00

Chairman: **Yeon Ho Im**, Chonbuk Nat'l Univ.

Chang Won Yoon, KIST

09:00	Introduction to measurement methods of atmospheric precursor gases and fine particle and their tracking method	Jinsang Jung , KRISS
09:30	Deactivation of CHA based urea/SCR catalyst in automotive exhaust	Iljeong Heo , KRICT
10:00	Catalytic technology for abatement of diesel particulate matter	Sung June Cho , Chonnam Nat'l Univ.
10:30	Coffee break	
10:50	Applications of plasma technology to reduce fine dust	Dae Hoon Lee , KIMM/UST
11:20	Reversible absorption media for the removal of SO ₂ from flue gas	Hyun Joo Lee , KIST/UST

Speaker



Jinsang Jung
KRISS



Iljeong Heo
KRICT



Sung June Cho,
Chonnam Nat'l Univ.



Dae Hoon Lee
KIMM/UST



Hyun Joo Lee
KIST/UST

Organizer/Chairman



Yeon Ho Im
Chonbuk Nat'l Univ.



Chang Won Yoon
KIST

Organizer



Won Gyu Lee
Kangwon Nat'l Univ.

Frontiers in next-generation catalysis symposium

Co-host: Division of Catalysis and Reaction Engineering, UNIST Next-Generation Catalysis Center

CECO Room M(600B)

April 27(Fri.) 2018, 09:10~15:40

Chairman: **Ja Hun Kwak**, UNIST

09:10	Opening remarks	Jae Sung Lee , UNIST
09:15	[Keynote Lecture] Solar hydrogen: Current status and prospect	Jae Sung Lee , UNIST
09:55	Optimization of photoelectrochemical cells for solar water splitting	Jong Hyeok Park , Yonsei Univ.
10:25	Coffee break	

Chairman: **Ji-Wook Jang**, UNIST

10:40	[Keynote Lecture] Photofunctional catalysts for solar energy utilization and conversion	Wonyong Choi , POSTECH
11:20	Power-to-chemicals catalyst for selective conversion	Yun Jeong Hwang , KIST
11:50	Lunch	

Chairman: **Kwangjin An**, UNIST

13:30	[Keynote Lecture] Next-generation electrocatalyst design for energy devices	Yung-Eun Sung , Seoul Nat'l Univ.
14:10	Balancing activity, stability and conductivity of nanoporous core-shell iridium/iridium oxide oxygen evolution catalysts	Yongtae Kim , Pusan Nat'l Univ.
14:40	DFT-based design of nano alloy catalysts: Surface d orbital occupancy and lattice strain engineering	Hyung Chul Ham , KIST
15:10	Catalyzing renewable energy conversion reactions by non-precious metal M-N/C catalysts	Sang Hoon Joo , UNIST

Speaker



Jong Hyeok Park
Yonsei Univ.



Wonyong Choi
POSTECH



Yun Jeong Hwang
KIST



Yung-Eun Sung
Seoul Nat'l Univ.



Yongtae Kim
Pusan Nat'l Univ.



Hyung Chul Ham
KIST



Sang Hoon Joo
UNIST



Jae Sung Lee
UNIST

Organizer/Speaker

Chairman



Ja Hun Kwak
UNIST



Ji-Wook Jang
UNIST



Kwangjin An
UNIST

KICHe young investigators symposium I

CECO Room C(301)

April 27(Fri.) 2018, 09:00~11:40

Chairman: **Seung Hyun Hur**, Univ. of Ulsan

[Polymer]

- | | | |
|-------|---|--|
| 09:00 | Study of solution-processed organic light-emitting diodes(OLEDs) | Taeshik Earmme , Hongik Univ. |
| 09:20 | Engineered core/shell quantum dots for injection laser diodes | Jaehoon Lim , Ajou Univ. |
| 09:40 | Small scale interface and surface engineering | Sanghyuk Wooh , Chung-Ang Univ. |
| 10:00 | Coffee break | |
| 10:20 | Site-selective in situ grown calcium carbonate micromodels with tunable geometry, porosity, and wettability | Seung Goo Lee , Univ. of Ulsan |

[Process Systems Engineering]

- | | | |
|-------|---|-----------------------|
| 10:40 | Non-aqueous amine CO ₂ capture process optimization using machine learning algorithm | Ung Lee , KIST |
|-------|---|-----------------------|

[Separation Technology / Energy and Environment]

- | | | |
|-------|---|------------------------------|
| 11:00 | Sub-angstrom molecular differentiation using carbon molecular sieve membranes | Dong-Yeun Koh , KAIST |
|-------|---|------------------------------|

[Fluidization]

- | | | |
|-------|--|-----------------------------|
| 11:20 | Thermochemical conversion of biomass wastes into bioenergy and bioproducts | Hyungseok Nam , KIER |
|-------|--|-----------------------------|

Speaker



Taeshik Earmme
Hongik Univ.



Jaehoon Lim
Ajou Univ.



Sanghyuk Wooh
Chung-Ang Univ.



Seung Goo Lee
Univ. of Ulsan



Ung Lee
KIST



Dong-Yeun Koh
KAIST



Hyungseok Nam
KIER



Chairman

Seung Hyun Hur
Univ. of Ulsan

KICHe young investigators symposium II

CECO Room C(301)

April 27(Fri.) 2018, 14:00~16:00

Chairman: **Jung Min Sohn**, Chonbuk Nat'l Univ.

[Catalysis and Reaction Engineering]

14:00 Catalytic biomass conversion to fuels & chemicals

Wonjin Jeon, KIER

[Materials]

14:20 Multi-scale simulation framework for solid-liquid interface:
Applications in energy and environmental systems**Hyung-Kyu Lim**, Kangwon Nat'l Univ.

14:40 Energy storage system for era of smart life

Inho Nam, Seoul Women's Univ.15:00 Development of efficient electrocatalysts based on
Mo-compounds for electrochemical hydrogen production**Duck Hyun Youn**, Kangwon Nat'l Univ.15:20 Intrinsically stretchable healable electronic materials for
e-skin applications**Jin Young Oh**, Kyung Hee Univ.15:40 Exploiting soft matter at interfaces for functional
materials production**Hyomin Lee**, POSTECH

Speaker



Wonjin Jeon
KIER



Hyung-Kyu Lim
Kangwon Nat'l Univ.



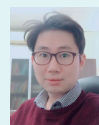
Inho Nam
Seoul Women's Univ.



Duck Hyun Youn
Kangwon Nat'l Univ.

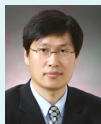


Jin Young Oh
Kyung Hee Univ.



Hyomin Lee
POSTECH

Organizer



Young Soo Ko
Kongju Nat'l Univ.



Jin Suk Chung
Ulsan of Univ.



Chairman

Jung Min Sohn
Chonbuk Nat'l Univ.

Meet the Young Researcher Poster Session

CECO Room D(302)

April 27(Fri.) 2018, 10:00~12:00

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|---------|--|---|
| PYRF-1 | Design of FO/crystallization/RO hybrid process for seawater desalination with various operating conditions | Kiho Park , Korea Univ. |
| PYRF-2 | Design of steam methane reforming bayonet reactor for hydrogen production from natural gas using CFD model | Ngo Ich Son , Hankyong Nat'l Univ. |
| PYRF-3 | Investigation on combustion characteristics of sewage sludge solid fuel using lab-scale fluidized bed reactor | Hyungjun Ahn , KITECH |
| PYRF-4 | Separation techniques for the production of high-purity hydrogen: development of sorption-enhanced reaction processes and hydrogen selective metal membranes | Chan Hyun Lee , KIST |
| PYRF-5 | Improvement of Xe/Kr separation performance by functionalization of Zr-based MOF ligand | Seung-Joon Lee , Yonsei Univ. |
| PYRF-6 | CO ₂ upcycling by mineralization of a carbonate-based cementation material | Hyuk Min Kweon , UCLA |
| PYRF-7 | Synthesis of gold nanoparticle stabilized by self-assembled tyrosine-rich peptide for redox catalysts | Namhun Lee , Kangwon Nat'l Univ. |
| PYRF-8 | Catalytic hydrogenation of a novel liquid organic hydrogen carrier: Eutectic mixture of biphenyl and diphenylmethane | Young Suk Jo , KIST |
| PYRF-9 | Electrochemical CO ₂ reduction to formate via oxygen bidentate intermediate on high-index planes of dendritic Bi catalyst | Da Hye Won , KIST |
| PYRF-10 | Mechanistic study of glycerol dehydration and development of a high-efficient catalyst for acrolein production | Danim Yun , Seoul Nat'l Univ. |

Speaker



Kiho Park
Korea Univ.



Chan Hyun Lee
KIST



Nam Hoon Lee
Kangwon Nat'l Univ.



Danim Yun
Seoul Nat'l Univ.



Ngo Ich Son
Hankyong Nat'l Univ.



Seung-Joon Lee
Yonsei Univ.



Young Suk Jo
KIST



Ki Bong Lee
Korea Univ.



Hyungjun Ahn
KITECH



Hyuk Min Kweon
UCLA



Da Hye Won
KIST

Organizer

Meet the Young Researcher Poster Session

CECO Room D(302)

April 27(Fri.) 2018, 10:00~12:00

- | | | |
|---------|---|---|
| PYRF-11 | Development of catalysts for the production of value-added chemicals from biomass-derived material | Yang Sik Yun , Seoul Nat'l Univ. |
| PYRF-12 | Triglyceride hydroconversion into biojet fuel | Myoung Yeob Kim , KAIST |
| PYRF-13 | Highly thermal conductive metal-ceramic core-shell microstructure as catalyst materials | Jieun Kim , Ajou Univ. |
| PYRF-14 | On the use of cooling microchannel for preventing thermal runaways in power battery systems | Krishnadas , Chung-Ang Univ. |
| PYRF-15 | Electrochemical evidence for two sub-families of FeNxCy moieties with concentration-dependent cyanide poisoning | Min Wook Chung , GIST |
| PYRF-16 | Colloidal growth and self-assembled structures of semiconductor nanorods | Dahin Kim , KAIST |
| PYRF-17 | Carrier dynamics in assembled anisotropic semiconductor nanocrystals | Whidong Kim , KAIST |
| PYRF-18 | Bioengineered mussel protein-based functional adhesive platform for dental implant applications | Yun Kee Jo , POSTECH |
| PYRF-19 | Development and application of underwater tissue adhesive using coacervated mussel adhesive protein | Hyo Jeong Kim , POSTECH |
| PYRF-20 | Modifier adaptation for optimizing chemical and biological processes under model-plant mismatch | Dong Hwi Jeong , Korea Univ. |

Speaker



Yang Sik Yun
Seoul Nat'l Univ.



Krishnadas
Chung-Ang Univ.



Whidong Kim
KAIST



Dong Hwi Jeong
Korea Univ.



Myoung Yeob Kim
KAIST



Min Wook Chung
GIST



Yun Kee Jo
POSTECH



Ki Bong Lee
Korea Univ.



Jieun Kim
Ajou Univ.



Dahin Kim
KAIST



Hyo Jeong Kim
POSTECH

Organizer



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