CUUTE-1 Programme at a Glance

Tue 14 December

Rehearsal
【on-line】

13:30–14:00
Chairpersons' meeting

14:00–18:00
On-line pre-test

Wed 15 December

Technical session
【on-line】

Room A	Room B	Room C
Opening		
Opening address Prof. Yukitaka Kato		
9:00–9:40 **[P1]** Plenary lecture Prof. Daqiang Cang		
9:40–10:00 **[K1]** Keynote lecture Mr. Toru Ono		
10:10–10:40 **[K2]** Keynote lecture Dr. Koichi Izumiya		
Break		
10:50–12:10 **[A1]** Iron and steel making industry	10:50–12:10 **[B1]** CO_2 capture/ separation	10:50–12:10 **[C1]** Chemical industry
12:10–13:40 **Lunch/Poster**		
13:40–15:00 **[A2]** Iron and steel making industry	13:40–15:00 **[B2]** CO_2 capture/ separation	13:40–15:00 **[C2]** System modeling and analysis
Break		
15:10–16:30 **[A3]** Iron and steel making industry	15:10–16:30 **[B3]** CO_2 capture/ separation	15:10–16:30 **[C3]** Megatrends in industrial sector, Generation and utilization of heat and power
Break		
16:40–17:20 **[P2]** Plenary lecture Dr. Martin Pei		
17:20–17:50 **[K3]** Keynote lecture Prof. Henrik Saxen		

Thu 16 December

Technical session
【on-line】

Room A	Room B	Room C
9:00–9:40 **[P3]** Plenary lecture Dr. Sang-Ho Yi		
9:40–10:10 **[K4]** Keynote lecture Mr. Todd Astoria		
Break		
10:20–12:00 **[A4]** Iron and steel making industry	10:20–12:00 **[B4]** CO_2 capture/ separation	10:20–12:00 **[C4]** CO_2 conversion/ utilization/ sequestration
12:00–13:00 **Lunch**		
13:00–14:40 **[A5]** Iron and steel making industry	13:00–14:40 **[B5]** CO_2 conversion/ utilization/ sequestration	13:00–14:40 **[C5]** Hydrogen-based energy system

Fri 17 December

Technical session
【Hybrid】
Nara Kasugano International Forum 𝌆 IRAKA

10:00–11:00
Registration at the IRAKA

11:00–11:20
Opening

11:20–12:00
[P4]
Plenary lecture
Prof. Takeo Hoshino

12:00–13:30
Lunch

13:30–14:10
[P5]
Plenary lecture
Dr. Keigo Akimoto

14:10–14:50
[P6]
Plenary lecture
Dr. Peter Levi

Break

15:05–16:05
Panel discussion

16:05–16:40
Awards/Photo/ Closing

Congress Programme

Wed 15 December

RoomA (On-line)

8:30～8:40

Opening

8:40～9:00

Opening Address

9:00～9:40

Plenary lecture 1

Chairperson：Hiroshi Nogami (Tohoku University)

P1 More GHG・Minimizing Carbon Emission and Some CCUS in China

○Daqiang Cang
University of Science and Technology Beijing

9:40～10:10

Keynote lecture 1

Chairperson：Hiroshi Nogami (Tohoku University)

K1 Challenges towards carbon-free ironmaking

○Toru Ono
Nippon Steel Research Institute

10:10～10:40

Keynote lecture 2

Chairperson：Hiroshi Nogami (Tohoku University)

K2 Methane Producing Technology from CO_2 for Carbon Recycling

○Koichi Izumiya, Izumo Shimada
Hitachi Zosen Corporation

10:50～12:10

Session A1 **Iron and steel making industry**

Chairperson：Hiroshi Nogami (Tohoku University)

A1-1 Development of ferro-coke process through national projects

○Michitaka Sato[1], Takashi Anyashiki[1], Kaoru Nakano[2], Takahiro Shishido[3]
[1)] JFE Steel Corporation, [2)] Nippon Steel Corporation, [3)] Kobe Steel, LTD

A1-2 Development of CO_2 Reduction Technology from Blast Furnace

Kaoru Nakano[1], ○Hiroshi Sakai[1], Koki Nishioka[1], Yutaka Ujisawa[1], Kazumoto Kakiuchi[1], Kohei Sunahara[1], Yoshinori Matsukura[1], Hirokazu Yokoyama[1], Shin Tomisaki[2]

[1)]NIPPON STEEL CORPORATION, [2)]NIPPON STEEL ENGINEERING CORPORATION

A1-3 Development of Mathematical Blast Furnace Model for CO_2 Reduction Technology (COURSE50)

○Hiroshi Sakai[1], Kaoru Nakano[1], Yutaka Ujisawa[1], Koki Nishioka[1], Kazumoto Kakiuchi[2], Kohei Sunahara[1], Yoshinori Matsukura[1], Hirokazu Yokoyama[1], Shin Tomisaki[2]

[1)]NIPPON STEEL CORPORATION, [2)]NIPPON STEEL ENGINEERING CORPORATION

13:40～15:00

Session A2 Iron and steel making industry

Chairperson : Michitaka Sato (JFE Steel Corporation)

A2-1 Separate Granulating Efficiency for Sinter Strength and Reducibility Based on Promotion of Magnetite Ore Oxidation

○Masaru Matsumura, Toru Takayma, Kyosuke Hara, Yasuhide Yamaguchi, Osamu Ishiyama, Kenichi Higuchi, Seiji Nomura

NIppon Steel Corporation

A2-2 Effect of CaO Component on the Property of Sintered Pellets Prepared by the Composite Sintering Process

○Zhe Ma[1], Shuya Nakamura[1], Daisuke Maruoka[1], Taichi Murakami[1], Eiki Kasai[1], Takahide Higuchi[2]

[1)]Graduate School of Environment Studies, Tohoku University, [2)]JFE Steel Corporation

A2-3 How to select the property of reducing agent for low carbon operation of the blast furnace

○Shigeru Ueda[1], Xu Gao[1,2], Hui Kong[3], Takayuki Iwama[1]

[1)]Tohoku University, [2)]Central South University, [3)]Anhui University of Technology

A2-4 Effect of Mineral Component on Carburization and Melting Behavior of Carbon-Iron Ore Composite

○Ryota Higashi, Daisuke Maruoka, Taichi Murakami, Eiki Kasai

Graduate School of Environmental Studies, Tohoku University

Wed 15 December

15:10～16:30

Session A3 Iron and steel making industry

Chairperson : Shigeru Ueda (Tohoku University)

A3-1 Thermodynamic Analysis of the Slag-metal Reactions in Blast Furnace and Packed Bed Type Partial Smelting Reduction Process for Utilization of Steel Scraps

○Kengo Kato[1], Hideki Ono[2]

[1)]Graduate School of Engineering, Osaka University, [2)]Academic Assembly, Faculty of Sustainable Design, University of Toyama

A3-2 Application of Oxygen Blast Furnace Technology to CCU for CO_2 Reduction

○Koichi Takahashi, Taihei Nouchi, Yuki Kawashiri, Yuya Morita, Yusuke Kashihara

JFE Steel Corporation

A3-3 Low carbon emission steel making technology using hydrogen: COURSE50 project

○Yutaka Ujisawa[1], Seiji Nomura[1], Takashi Watanabe[2], Shin Sugiyama[1], Natsuo Ishiwata[2], Hideki Murakami[1]

[1)]Nippon Steel Corporation, [2)]JFE Steel Corporation

A3-4 Decarbonisation of carbon-intensive industries (Iron and Steel Industries) through Power to gas and Oxy-fuel combustion

○Manuel Bailera[1,2], Takao Nakagaki[2], Irmela Kofler[3], Luis M Romeo[1]

[1)]University of Zaragoza, [2)]Waseda University, [3)]K1-MET GmbH

16:40～17:20

Plenary lecture 2

Chairperson : Yukitaka Kato (Tokyo Institute of Technology)

P2 Towards fossil-free steelmaking in Sweden and Finland

○Martin Pei

SSAB AB

17:20～17:50

Keynote lecture 3

Chairperson : Shigeru Ueda (Tohoku University)

K3 Economic assessment of biochar injection in the blast furnace

○Henrik Saxen, Mikko Helle

Abo Akademi University

RoomB (On-line)

10:50～12:10

Session B1 CO_2 capture/separation

Chairperson : Hidetaka Yamada (Kanazawa University)

B1-1 Advanced KM CDR Process™ and New KS-21 Solvent™

○Takashi Kamijo, Tomoki Noborisato, Teruaki Morihiro
Mitsubishi Heavy Industries Engineering,LTD

B1-2 Heat recovery from low-temperature off-gas for use in CO_2 separation processes

○Kazuaki Kobayashi, Hiroyuki Kozuru, Masahiro Sekiya
Nippon Steel Corporation

B1-3 Tomakomai CCS Demonstration Project – Results and Lessons Learnedk

Yoshihiro Sawada, ○Jiro Tanaka, Daiji Tanase, Takashi Sasaki, Chiyoko Suzuki
Japan CCS Co., Ltd.

B1-4 Design and Economic Analysis of Direct Air Capture of CO_2 by Temperature Vacuum Swing Adsorption using Metal Organic Frameworks

Anshuman Sinha[1], Lalit Darunte[1], Christopher Jones[1], Youn Ji Min[1],
○Yoshiaki Kawajiri[1,2], Matthew Realff[1]
[1)]School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, USA,
[2)]Department of Materials Process Engineering, Nagoya University, Japan

13:40～15:00

Session B2 CO_2 capture/separation

Chairperson : Takao Nakagaki (Waseda University)

B2-1 Development of CO_2 Capture Technology with Solid Sorbent Utilizing Low-Temperature Steam

○Shohei Nishibe[1], Katsuhiro Yoshizawa[1], Takeshi Okumura[1], Ryohei Numaguchi[1],
Kazuo Tanaka[1], Hidetaka Yamada[2], Tomohiro Kinosita[2], Takayasu Kiyokawa[2],
Shin Yamamoto[2], Katsunori Yogo[2]
[1)]Kawasaki Heavy Industries, Ltd., [2)]Research Institute of Innovative Technology for the Earth

B2-2 Development of molecular gate membrane modules for pre-combustion CO_2 capture

○Teruhiko Kai, Shuhong Duan, Fuminori Ito, Kenjiro Ishiguro, Koji Baba,
Keisuke Sugita, Shin-Ichi Nakao
Molecular Gate Membrane module Technology Research Association (MGMTRA)

B2-3 Progress of Osaki CoolGen Oxygen-blown IGCC with CO_2 Capture Demonstration

○Yugo Ishizaki
OSAKI CoolGen Corporation

B2-4 Development of the High-efficiency Oxy-fuel IGCC System

○Yuso Oki[1], Kazuhiro Kidoguchi[1], Hiroki Umetsu[1], Yoshinobu Nakao[1]
[1)]CRIEPI, [2)]CRIEPI, [3)]CRIEPI, [4)]CRIEPI

15:10～16:30

Session B3 CO_2 capture/separation

Chairperson：Corey Myers (Waseda University)

B3-1 Development and Evaluation of New Amine Solvent using Mikawa PCC Pilot Plant

○Koshito Fujita, Shinji Murai, Daigo Muraoka, Yasuhiro Kato, Hayato Morigaki
Toshiba Energy Systems & Solutions Corporation

B3-2 Carbon capture initiatives at Air Liquide: From industrial recovery to utilization

○Marvin Benzaqui, Juan Paulo Wiff, Laurent Prost
Air Liquide Laboratories

B3-3 Molten ionic oxides for new class of high temperature looping CO_2 capture

○Takuya Harada[1], Cameron Halliday[2], T. Alan Hatton[2]
[1)]Department of Chemical Science and Engineering, Tokyo Institute of Technology, [2)]Department of Chemical Engineering, Massachusetts Institute of Technology

RoomC (On-line)

10:50～12:10

Session C1 Chemical industry

Chairperson：Yukitaka Kato (Tokyo Institute of Technology)

C1-1 New Catalytic Reactions for CO_2 Hydrogenation

Noritatsu Tsubaki[1], ○Guohui Yang[1], Kimihito Suzuki[2], Kenji Nakao[2], Yuzuru Kato[3], Kentaroh Morita[3]
[1)]Univ. of Toyama, [2)]Nippon Steel Co., [3)]Nippon Steel Engineering Co.

C1-2 Fluidized bed gasification of empty fruits bunches with clay mineral bed materials

○Reiji Noda, Sun Yan, Purima Zuldian
Gunma Univ.

C1-3 Direct Transformation of CO_2 and Diols to Polycarbonate Diols by Cerium Oxide Catalyst

○Masazumi Tamura[1], Yu Gu[1], Kenji Nakao[2], Kimihito Suzuki[2], Kentaro Morita[3], Yuzuru Kato[3], Yoshinao Nakagawa[1], Keiichi Tomishige[1]
[1)]Tohoku University, [2)]Nippon Steel Corporation, [3)]Nippon Steel Engineering Co., Ltd.

C1-4 Dimethyl carbonate synthesis from CO_2 and methanol combined with the hydration of 2-cyanopyridine using CeO_2 catalyst

○Keiichi Tomishige[1], Masazumi Tamura[1], Yoshinao Nakagawa[1], Kimihito Suzuki[2], Kenji Nakao[2], Yuzuru Kato[3], Kentaro Morita[3], Hidefumi Harada[4], Yousuke Shinkai[4]

[1)]Tohoku University, [2)]Nippon Steel Corporation, [3)]Nippon Steel Engineering Co., Ltd., [4)]Mitsubishi Gas Chemical Co. Inc.

13:40～15:00

Session C2 System modeling and analysis

Chairperson : Nobuhiro Maruoka (Tohoku University)

C2-1 Exergy-based analysis of different carbon capture and utilization technologies

○Ichiro Daigo[1], Jun Yanai[2], Junxi Liu[3], Takeo Hoshino[3]

[1)]Research Center for Advanced Science and Technology, The University of Tokyo, [2)]School of Engineering, The University of Tokyo, [3)]Graduate School of Engineering, The University of Tokyo

C2-2 Impact of hydrogen ironmaking on reactive nitrogen emission

○Kiwamu Katagiri, Kazuyo Matsubae

Tohoku University

C2-3 Methodology of Exergy-based Life Cycle Sustainability Assessment for Next Generation Vehicles

○Keisuke Onishi[1], Ichiro Daigo[2], Takeo Hoshino[1]

[1)]Department of Materials Engineering, The University of Tokyo, [2)]Research Center for Advanced Science and Technology, The University of Tokyo

C2-4 Effect of electricity mix for total material requirement of hydrogen steelmaking process

○Shunsuke Kashiwakura[1], Shoki Kosai[1], Kenichi Nakajima[2], Eiji Yamasue[1]

[1)]Ritsumeikan University, [2)]National Institute for Environmental Studies

15:10～16:30

Session C3 Megatrends in industrial sector, Generation and utilization of heat and power

Chairperson : Takahiro Nomura (Hokkaido University)

C3-1 Long-term experiment of hot spring heat recovery using a rotary heat exchanger by controlling precipitation

○Nobuhiro Maruoka[1], Takuya Yamamoto[1], Satoshi Endo[2], Tadanobu Aizawa[2], Toshimitsu Ono[2], Hiroshi Sasaki[3], Keisuke Ura[4], Nobuhiro Ito[4], Katsuhiro Oyama[5], Keiichiro Maeda[5]

[1)]Tohoku University, [2)]Mabuchi engineering Co., Ltd, [3)]Nagasaki University, [4)]Industrial Technology Institute, Miyagi Prefectural Government, [5)]Japan Sustainable Free Powered Energy System Exploit & Promotion Association (JASFA)

C3-2 Development of composite materials using calcium hydroxide and silicon-silicon carbide ceramic supports for high-temperature thermochemical energy storage

○Shigehiko Funayama[1], Takahiro Furuya[2], Hiroki Takasu[1], Yukitaka Kato[1]

[1)]Laboratory for Zero-Carbon Energy, Institute of Innovative Research, Tokyo Institute of Technology, [2)]Graduate Major in Nuclear Engineering, Department of Transdisciplinary Science and Engineering, Tokyo Institute of Technology

C3-3 Formation Behavior of Surface Layer on Iron-Base Heat Storage Materials by Aluminizing

○Daisuke Maruoka[1], Kosuke Sato[2], Shun Miura[3], Taichi Murakami[1], Eiki Kasai[1]

[1)]Graduate School of Environmental Studies, Tohoku University, [2)]Mitsui Mining & Smelting Co., Ltd., [3)]Kobe Steel Ltd.

C3-4 The Challenges of the Steel Industry - Leaving Carbon behind

○Alexander Fleischanderl

Primetals Technologies Austria GmbH

On-line

12:10～13:40

Poster Session

PS-1 Equilibrium between titanium and oxygen in Fe-Ti molten alloy containing high concentration Ti at 1873K

○Yong Woo Kim[1], Sun-Joong Kim[2]

[1)]Dept. of Advanced Materials Engineering, Master, Chosun University, Gwangju, 61452, KOREA, [2)]Dept. of Materials Science & Engineering, Professor, Chosun University, Gwangju, 61452, KOREA

PS-2 Development of CO_2 conversion process using coke oven

○Kenji Nakao, Hiraku Sato, Noriyuki Yamane, Kimihito Suzuki, Masayuki Nishifuji

Advanced Technology Research Laboratories, Nippon Steel Corporation

PS-3 Electrolysis performance of a metal-supported solid oxide electrolysis cell for low-carbon iron making process

○Sho Kuzukami[1], Yuko Maruyama[1], Shuzo Tominaga[1], Hiroki Takasu[2], Yukitaka Kato[1]

[1)]Graduate Major in Nuclear Engineering, Department of Chemical Science and Engineering, School of Materials and Chemical Technology, Tokyo Institute of Technology, [2)]Laboratory for Zero-Carbon Energy, Institute of Innovative Research, Tokyo Institute of Technology

PS-4 Extraction of phosphorus from steelmaking slag using carbon dioxide

○Takeshi Toyama[1], Ayaka Inagaki[1], Nobuhiro Maruoka[2]

[1)]College of Science and Technology, Nihon University, [2)]Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

PS-5 Grinding-based enhancement of CO_2 mineralization rate and extent using steel slag

○Jun Sasagawa, Takao Nakagaki, Corey Myers
Waseda University

PS-6 High-Thermal-Conductivity, High-Durability Phase-Change Composite enhanced by a new type of Carbon fibre sheet matrix

○Kaixin Dong[1], Deqiu Zou[2], Cheng Wang[3], Kenji Shimono[4], Takahiro Nomura[5]
[1)]Graduate School of Engineering, Hokkaido University, Kita 13 Nishi 8, Kita-ku, Sapporo, Hokkaido, 060-8628, Japan, [2)]Faculty of Maritime and Transportation, Ningbo University, Ningbo 315211, Zhejiang, China, [3)]Jiangsu Provincial Key Laboratory of Oil & Gas Storage and Transportation Technology, Changzhou University, Changzhou 213016, Jiangsu, China, [4)]Azumi Filter Paper CO., LTD., 4-2-15, Komatsu, HigashiYodogawa-ku, Osaka 533-0004, Japan, [5)]Faculty of Engineering, Hokkaido University, Kita 13 Nishi 8, Kita-ku, Sapporo 060-8628, Japan

PS-7 Evaluation of chemical heat pump performance of magnesium chloride and ammonia system

○Saki Yoshida[1], Junko Kaneko[1], Hiroki Takasu[2], Yukitaka Kato[2]
[1)]Graduate Major in Nuclear Engineering, Department of Chemical Science and Engineering, School of Materials and Chemical Technology, Tokyo Institute of Technology, [2)]Laboratory for Zero-Carbon Energy, Institute of Innovative Research, Tokyo Institute of Technology

PS-8 Effect of nozzle position and separation angle on perfect mixing time during bottom gas injection using water model.

○Mi-Ran Na[1], Sun-Joong Kim[2]
[1)]Department of Advanced Materials Engineering, Chosun University, Gwangju, Republic Korea (South Korea), [2)]Department of Materials Science & Engineering, Chosun University, Gwangju, Republic Korea (South Korea)

PS-9 Influence of sintering time and slag basicity on calcium-ferrite formation in sintered ore and changes in temperature

○Geun Yong Ryu[1], Sun-Joong Kim[2], Ki-Woo Lee[3], Ju-Hee Choi[4]
[1)]Department of Advanced Materials Engineering, Chosun University, Gwangju, Republic Korea (South Korea), [2)]Department of Materials Science & Engineering, Chosun University, Gwangju, Republic Korea (South Korea), [3)]Ironmaking Technology Development Team, Hyundai steel, Dangjin, Republic Korea (South Korea)

PS-10 Development of the technology for producing Ferro-coke: Influence of solid content in the new binder

○Shohei Wada, Takahiro Shishido, Ryuichi Kobori, Koji Sakai, Noriyuki Okuyama
KOBE STEEL

PS-11 Utilization of waste hot water from hot-spring towards low carbon cultivation of tropical crops in greenhouse: The case of cacao in snowy region

○Takayuki Takehi, Hajime Ohno, Yuta Nakayasu
Tohoku University

Thu 16 December

RoomA (On-line)

9:00～9:40

Plenary lecture 3

Chairperson : Shigeru Ueda (Tohoku University)

P3 Carbon Neutral Goals and Strategies in Korea's Coal Based Steel Industry

○Sang-Ho Yi
POSCO

9:40～10:10

Keynote lecture 4

Chairperson : Takao Nakagaki (Waseda University)

K4 MIDREX® Process: Bridge to Ultra-low CO_2 Ironmaking

○Todd Astoria
Midrex Technologies, Inc.

10:20～12:00

Session A4 Iron and steel making industry

Chairperson : Yutaka Ujisawa (Nippon Steel Corporation)

A4-1 Evaluation of CO_2 mitigation in oxygen blast furnace steelworks

○Ryoma Kataoka[1], Kento Nakamura[1], Takao Nakagaki[1], Koichi Takahashi[2], Koichi Tsutsumi[2]
[1)]Waseda University, [2)]JFE Steel

A4-2 Thermodynamic Analysis on Minimum Carbon Usage in Ironmaking Process

○Hiroshi Nogami
Tohoku University

A4-3 Towards low-carbon ironmaking process: exergy analysis and CO_2 emission evaluation on the proposed utilization of ethanol as reducing agents

○Ade Kurniawan, Takahiro Nomura
Hokkaido University, Faculty of Engineering, Center for Advanced Research of Energy and Materials

A4-4 Reduction of CO_2 Emission through a Dry Quenching Method of Steelmaking Slags: Rotary Cylinder Atomizing of Molten Slag

○Yoshiaki Kashiwaya[1], Yutaro In-Nami[1], Takahiro Nomura[3], Tomohiro Akiyama[3]
[1)]Kyoto University, Graduate School of Energy Science, [2)]Student of Hokkaido University, [3)]Hokkaido University

A4-5 Study on composite material in thermochemical energy storage system for iron and steel making industry

○Rui Guo[1], Shigehiko Funayama[1], Hiroki Takasu[2], Yukitaka Kato[2]

[1)]Graduate major of Nuclear Engineering, Department of Chemical Science and Engineering, School of Materials and Chemical Technology, Tokyo Institute of Technology., [2)]Laboratory for Zero-Carbon Energy Institute of Innovative Research,Tokyo Institute of Technology, 2-12-1-N1-22, Ookayama, Meguro-ku, Tokyo, 152-8550, Japan

13:20～14:40

Session A5 Iron and steel making industry

Chairperson : Takanori Yoshioka (Sanyo Special Steel Co., Ltd.)

A5-2 Synthesis of Carbide by Using Biomass as Antioxidant for Carbon Containing Refractories

○Tomoyuki Maeda, Hatsuo Taira

Okayama Ceramics Research Foundation

A5-3 Study of changing behavior of inclusion composition in type 304 stainless steel during RHOB-LF process

Takanori Yoshioka, ○Yuta Shimamura

Sanyo Special Steel Co., Ltd.

A5-4 The effect of densification on charcoal properties

○Hamideh Kaffash, Merete Tangstad

Norwegian University of Science and Technology

A5-5 An Empirical Comparative Study of Renewable Biochar and Fossil Carbon as Carburizer in Steelmaking

Ryan Robinson[1], ○Liviu Brabie[1], Pettersson Magnus[1], Marko Amovic[2], Rolf Ljunggren[2]

[1)]Hoganas AB, [2)]Cortus Energy AB

RoomB (On-line)

10:20～12:00

Session B4 CO_2 capture/separation

Chairperson : Teruhiko Kai (Research Institute of Innovative Technology for the Earth (RITE))

B4-1 Development of CO_2 Chemical Adsorption Technology

○Yoichi Matsuzaki[1], Shin Yamamoto[2], Hidetaka Yamada[2], Firoz Alam Chowdhury[2], Kazuya Goto[2]

[1)]Nippon Steel Corporation, [2)]Research Institute of Innovative Technology for the Earth

B4-2 CO_2 separation by using gas fraction PSA for CO_2 utilization processes

○Nobuyuki Shigaki, Yasuhiro Mogi, Takashi Haraoka, Goro Okuyama

JFE Steel Corporation

B4-3 Stability of Amine Solid Sorbents for Postcombustion CO_2 Capture

○Quyen Thi Vu, Hidetaka Yamada, Katsunori Yogo
Research Institute of Innovative Technology for the Earth

B4-4 Preparation of AEI-type zeolite membrane and its separation property

○Motomu Sakai[1], Yusuke Hashizume[2], Masahiko Matsukata[1,2,3]
[1)]Research Organization for Nano & Life Innovation, Waseda University, [2)]Department of Applied Chemistry, Waseda University, [3)]Advanced Research Institute for Science and Engineering, Waseda University

B4-5 Materials informatics for designing CO_2 capturing liquids with selectivity

○Hirotoshi Mori, Nahoko Kuroki
Chuo University

13:00～14:40

Session B5 CO_2 conversion/utilization/sequestration

Chairperson : Hirotoshi Mori (Chuo University)

B5-1 Effective Synthesis of CO by Electro-reduction of CO_2 Gas with Water using a SPE-electrolysis Cell

Ichiro Yamanaka, ○Siyuan Jia, Yuki Senba, Shoji Iguchi
Tokyo Institute of Technology

B5-2 Electrochemical CO_2 Conversion Using a Zero-gap Electrolysis Cell

○Yusuke Kofuji, Yasuhiro Kiyota, Akihiko Ono, Satoshi Mikoshiba, Ryota Kitagawa
Corporate Research & Development Center, Toshiba Corporation

B5-3 CO_2 Reduction into Fuel by Pd/TiO_2 Photocatalyst Changing the Combination of H^+ Provider

○Akira Nishimura, Tadaaki Inoue, Yoshito Sakakibara, Masafumi Hirota, Akira Koshio
Mie University

B5-4 Decomposition of CO_2 Gas in Molten Salt

○Ryosuke O. Suzuki[1,2], Fumiya Matsuura[1], Takafumi Wakamatsu[1], Itsuki Iwamoto[1], Ryota Kanda[2], Masayuki Takahashi[1], Shungo Natsui[1,3], Tatsuya Kikuchi[1]
[1)]Faculty of Engineering, Hokkaido University, [2)]Science Lab. SUZUKI, [3)]Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

B5-5 Co-encapsulated MFI zeolite catalyst for FTTO

○Masahiko Matsukata, Soushi Kasuya, Motomu Sakai
Waseda University

RoomC (On-line)

10:20～12:00

Session C4 CO_2 conversion/utilization/sequestration

Chairperson : Yukitaka Kato (Tokyo Institute of Technology)

C4-1 Upgrading of CO_2 to fuel and chemicals through CO_2 recycling technology

Takumi Endo[1], Hiroyuki Kamata[3], Atsushi Nonomura[1], Yasuro Yamanaka[2], Kentaro Nariai[3], Takuya Hashimoto[4], Chee Kok Poh[5], Kelvin Kwok[5], Jie Chang[5], Shi Chang Teo[5], Chuandayani Gunawan Gwie[5], Terence Seah[5], Luwei Chen[5], Armando Borgna[5], ○Jun Tsujikawa[3]

[1)]Basic Design Group, Basic Design Department, Engineering Center, Carbon Solution Business Unit, Resources, Energy & Environment Business Area, IHI, [2)]R&D Department, Engineering Center, Carbon Solution Business Unit, Resources, Energy & Environment Business Area, IHI, [3)]Applied Physics & Chemistry Group, Technology Platform Center, Technology & Intelligence Integration, IHI, [4)]Energy Solution Group, Regional Innovation & Solution Centre, IHI ASIA PACIFIC PTE. LTD., [5)]Process and Catalysis Research Division, Institute of Chemical and Engineering Sciences, A*STAR (Agency for Science, Technology and Research)

C4-2 Novel iron-making process using organic acid derived from CO_2

○Shinji Kudo, Phatchada Santawaja, Aska Mori, Jun-Ichiro Hayashi

Kyushu University

C4-3 Maximizing conversion of CO_2 and waste brine into construction materials

○Corey Adam Myers, Takao Nakagaki, Yuto Watanabe

Waseda University

C4-4 Mineral Carbon Capture and Utilization Technology using Concrete Sludge

○Takeshi Sasaki[1], Yasuyuki Hayakawa[1], Atsushi Iizuka[2], Akihiro Yamasaki[3]

[1)]Nippon Concrete Industries Co., Ltd., [2)]Tohoku University, [3)]Seikei University

C4-5 Fixation of Carbon Dioxide by Using Concrete Sludge

○Masahiro Abe, Shunsuke Tanaka, Miyuki Noguchi, Akihiro Yamasaki

Department of Materials and Life Science, Faculty of Science and Technology, Seikei University

13:00～14:40

Session C5 Hydrogen-based energy system

Chairperson : Hideki Murakami (Nippon Steel Corporation)

C5-1 R&D of CO_2-free hydrogen production technology using thermochemical water-Splitting iodine-sulfur process

○Shinji Kubo, Hiroaki Takegami, Nobuyuki Tanaka, Hiroki Noguchi, Yu Kamiji, Myagmarjav Odtsetseg

Japan Atomic Energy Agency

C5-2 Development of Metal Composite Hydrogen Permeable Membrane by Reverse Build-up Method

○Yasunari Shinoda[1], Masakazu Takeuchi[1], Hiroki Takasu[2], Yukitaka Kato[2]

[1)]Graduate Major in Nuclear Engineering, Department of Chemical Science and Engineering, School of Materials and Chemical Technology, Tokyo Institute of Technology, [2)]Laboratory for Zero-Carbon Energy, Institute of Innovative Research, Tokyo Institute of Technology

C5-3 International Liquefied Hydrogen Supply Chain pilot demonstration project

○Ryo Chishiro, Yasushi Yoshino, Kenjiro Shindo

Kawasaki Heavy Industries, LTD.

C5-4 Development of hydrogen combustion technology that contributes to decarbonization of industrial furnaces.

○Shuhei Taguchi, Kenichi Tomozawa

ChugaiRo Co.,Ltd.

C5-5 CO_2 methanation over Ru/ZrO_2 catalysts

○Shohei Tada[1], Hironori Nagase[2], Rei Naito[2], Ryuji Kikuchi[2]

[1)]Ibaraki University, [2)]The University of Tokyo

Fri 17 December

Noh Theatre (Nara Kasugano International Forum 甍 IRAKA)

11:00～11:20

Opening

11:20～12:00

Plenary lecture 4

Chairperson : Hideki Murakami (Nippon Steel Corporation)

P4 Japan's Green Growth Strategy to Support 2050 Carbon Neutral Goal

○Takeo Hoshino
The University of Tokyo

13:30～14:10

Plenary lecture 5

Chairperson : Yukitaka Kato (Tokyo Institute of Technology)

P5 The role of CCUS for the pathways toward carbon neutrality

○Keigo Akimoto
Research Institute of Innovative Technology for the Earth (RITE)

14:10～14:50

Plenary lecture 6

Chairperson : Yukitaka Kato (Tokyo Institute of Technology)

P6 Net Zero by 2050: A Roadmap for the Global Energy Sector

○Peter Levi
International Energy Agency

15:05～16:05

Panel Discussion with RITE collaboration **Pathways toward Carbon Neutral Industries after COP26**

Panelists : Prof. Kenji Yamaji (Research Institute of Innovative Technology for the Earth, RITE)
Dr. Peter Levi (International Energy Agency)
Dr. Keigo Akimoto (RITE)
Moderator : Yukitaka Kato (Tokyo Institute of Technology)

16:05～16:40

Awards/Photo/Closing **Awards/Photo/Closing**