
Presentation Program

- (1) Click the presentation number at the left side to view the presentation document.
 - (2) The total allotted time for each paper is 20 minutes of which 15 minutes are for presentation and remaining 5 minutes are for discussion.
 - (3) In the case of multiple authors from same institution, the affiliation of the first author from each institution is mentioned. The affiliation(s) of other author(s) is same as the preceding author.
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Room A : Monday 23 October

Organized Session OS-1
Next Generation Refrigeration Systems
Organizer: Fumio Matsuoka (Mitsubishi Electric)

9:20~10:20 OS-1(1) [Chairperson: Fumio Matsuoka (Mitsubishi Electric)]

A101 Development of Room Temperature Magnetic Refrigerator — Overall Plan —
Naoki Hirano (Chubu Electric Power Co. Inc.), Shigeo Nagaya, Tetsuji Okamura (Tokyo Tech.), Tsuyoshi Kawanami (Hokkaido Univ.), Hirofumi Wada (Kyushu Univ.)

A102 Study on Performance Improvement of Room Temperature Magnetic Refrigerator
Reona Rachi (Tokyo Tech.), Tetsuji Okamura, Naoki Hirano (Chubu Electric Power Co. Inc.), Shigeo Nagaya

A103 Fundamental Characteristics of a Room-temperature Magnetic Refrigerator for Air-cooling
Tsuyoshi Kawanami (Hokkaido Univ.), Kohei Sakurai, Keigo Yamada, Masahiro Ikegawa, Shigeo Nagaya (Chubu Electric Power Co., Inc), Naoki Hirano

10:30~11:50 OS-1(2) [Chairperson: Takeyuki Maekawa (Mitsubishi Electric)]

A104 Studies of the Water Adsorption on Metal-doped Mesoporous Silica
Yuki Inagi (Aist), Satoko Fujisaki, Akira Endo, Masaru Nakaiwa, Takao Ohmori

A105 Development of High Performance Dehumidifier Air Cycle using an Advanced Polymer Sorbent. (3rd Report: Performance of a Prototype Air Cycle Refrigeration System and Investigation of Its Energy Conservation Effect.)
Keitaro Abe (Mayekawa Mfg.co.,Ltd), Nobuya Ishitsuka, Toshikazu Sabusawa, Akito Machida

A106 Performance Analysis of Rotary Dehumidifier/Humidifier and Systems (3rd Report: A Simple Method for the Performance Evaluation)
Yoshinori Hamamoto (Kyushu Univ.), Hideo Mori, Fumio Matsuoka (Mitsubishi Electric)

A107 A Molecular Dynamics Study of Water Molecules Confined in Ordered Mesoporous Silicas
Katsuhiko Shirono (Tokyo Univ.), Hirofumi Daiguji

13:00~14:00 OS-1(3) [Chairperson: Hirofumi Daiguji (Tokyo Univ.)]

A108 Experimental Study on the Performance of a Refrigerant Mixture CO₂/DME System
Shigeru Koyama (Kyushu Univ.), Nobuo Takata, Ken Kuwahara, Dong-Xu Jin, Jun Xue, Akio Miyara (Saga Univ.)

A109 Performance Characteristics of Vapor Compression Refrigerating Cycle Based on Ericsson Cycle
Nobumi Ino (Mayekawa Mfg. Co., Ltd.), Takayuki Kishi, Toshio Nishio

A110 Absorption/Compression Cycle using Liquid Ring Compressor (Evaluation of Performance Based on P-h Chart Analysis)
Naoki Endo (Aist)

Refrigeration Technology Experts Seminar, SN-1

- 14:10~16:10 SN-1 [Chairperson: Morimitsu Kinoshita (Toyo Carrier Engineering)]
- A111 Recent Technology and Trend on Air Conditioning Systems for Reilcar
Masahide Hashimoto (Mitsubishi Electric Co.)
 - A112 Cooling and Freezing Technologies in Medical Treatments and Freezing of Living Cells
Hiroshi Takamatsu (Kyushu Univ.)
 - A113 A Consideration on Natural Refrigerant Safety Applying for a Food Processing Factory in Kyushu Area (Ammonia Refrigerating System with Safety Considerations)
Shinjiro Akaboshi (Mayekawa Mfg. Co. Ltd.)

Workshop WS-3 Energy Conservative Technology Development

- 16:20~18:00 WS-3 [Chairperson: Masafumi Katsuta (Waseda Univ.)]
- A114 **[Keynote]** Dua-Cool Air Conditioner - 85% Energy Conservation
Kiyoshi Yanagimachi (Yanagimachi Institute of Energy Saving for Air Conditioning)
 - A115 Energy-saving Technologies for Room Air-conditioners
Atsudhi Kubota (Hitachi Ltd.)
 - A116 Developemnt Challenge and Future Perspectives of Absorption Refrigerators
Kunihiko Nakajima (Kawasaki Heavy Industry (former))
 - A117 Novel Energy Saving Method for Special Refrigeration System Including Natural Refrigerant
Masafumi Katsuta (Waseda Univ.)

Room B : Monday 23 October

Organized Session OS-8 Technological Development in Heat Exchangers Organizer: Hideo Mori(Kyushu Univ.), Akio Miyara (Saga Univ.)

- 9:40~10:30 OS-8(1) [Chairperson: Akio Miyara (Saga Univ.)]
- B101 **[Keynote]** Measurements of the Effective Thermal Conductivity and Thermal Diffusivity of Nanofluids
Fujii Motoo (Kyushu Univ.)
 - B102 Performance Analysis of Microchannel Heat Exchanger for Refrigerants (Part II)
Susumu Yoshimura (Mitsubishi Electric Corp.), Shinichi Wakamoto, Toshihide Kouda
 - B103 Moved to OS-8(7)
 - B104 Moved to OS-8(7)

- 10:50~12:30 OS-8(2) [Chairperson: Lei Gao (Fukuoka Univ.)]
- B105 Measurement of Thermal Contact Conductance Between Fin-Collar and Tube
Norio Sawada (Sanyo Electric Co., Ltd.)
 - B106 Influence of Various Factors on Performance of Cross Fin-Tube Heat Exchanger
Shiro Kakiyama (Sumitomo Light Metal, Ltd.), Yoshihiko Mizuta, Norihisa Isomura, Naoe Sasaki
 - B107 Effects of Deformations During Production Process on Heat Transfer Performance of Fin-Tube Heat Exchangers
Akio Miyara (Saga Univ.), Koutaro Tsubaki, Yuma Nagai, Naoe Sasaki (Sumitomo Light Metal, Ltd.), Yoshihiko Mizuta

- B108** Mist Formation in Heat Exchanger of Air-conditioner with Slit Fin
Isao Ishihara (Kansai Univ.), Ryosuke Matsumoto, Yutaka Shibata (Daikin Air-conditioning and Environmental Laboratory)
- B109** A New Method for Measuring Cooling Capacity of Unit Coolers (Measurement Considering Frost Formation)
Shino Kajitani (Tokyo Univ. of Marine Science and Technology), Manabu Watanabe, Noboru Sakai, Masakazu Hara (Japan Cooler Association)

13:30~15:00 OS-8(3) [Chairperson: Hideo Mori(Kyushu Univ.)]

- B110** [Keynote] Enhancement of Phase Change by Hydrophilic Surface
Yasuyuki Takata (Kyushu Univ.)
- B111** Boiling Heat Transfer and Pressure Drop of Refrigerant Flowing Upward in a Vertical Small Diameter Tube.
Kazushi Miyata (Kyushu Univ.), Ryohei Matsuo (Hitachi Ltd.), Katsumi Ohishi (Kyushu Univ.), Hideo Mori
- B112** The Advanced Performance of Refrigeration Cycle with an Ejector for Recirculation (Effect of Supply Refrigerant Mass Flow Rates in Plate Type Evaporators)
Daigo Kittaka (Takasago Thermal Eng.), Tarsunori Man'o, Masayuki Tanino, Takashi Okazaki (Mitsubishi Electric Corp.)
- B113** The Advanced Performance of Refrigeration Cycle with an Ejector for Recirculation (Effect on Distribution of Refrigerant in Plate-type Evaporators)
Tatsunori Man'o (Takasago Thermal Eng.), Daigo Kittaka, Masayuki Tanino, Takashi Okazaki (Mitsubishi Electric Corp.), Shigeru Koyama (Kyushu Univ.)

15:10~16:30 OS-8(4) [Chairperson: Satoru Momoki(Nagasaki Univ.)]

- B114** Moved to OS-8(7)
- B115** Flow Boiling Heat Transfer Characteristics of CO₂ and Influence of Lubricating Oil in a Micro-fin Tube
Lei Gao (Fukuoka Univ.), Takashi Ono, Tomohiro Honda
- B116** The Evaporating Heat Transfer Characteristics on Refrigeration Cycle in the Tube — The Oil Mixing Effect in Case of R744 and R600a/R744 —
Masafumi Katsuta (Waseda Univ.), Ryo Haga, Shinya Kishi
- B117** Experimental Study on Cooling Heat Transfer and Pressure Drop of Supercritical Carbon Dioxide Flowing in Horizontal, Spirally Grooved Tubes under Supercritical Pressures
Shigeru Koyama (Kyushu Univ.), Ken Kuwahara, Shinya Higashiue, Satoru Yanachi, Daisuke Ito (Kyushu Univ. (former))
- B118** Heat Transfer Enhancement of Water-CO₂ Heat Exchanger for CO₂ Heat-Pump Water Heaters
Mitsuharu Numata (Daikin Air-conditioning and Environmental Laboratory), Shuji Furui, Kazushige Kasai

16:40~18:00 OS-8(5) [Chairperson: Shun Yoshioka (Daikin Air-conditioning and Environmental Laboratory)]

- B119** Boiling Heat Transfer in a Narrow Channel with Thermal Spray Coating
Hitoshi Asano (Kobe Univ.), Kosuke Aoki, Sumida Tomohiro, Sugimoto Katsumi, Takenaka Nobuyuki
- B120** Effect of Flow Direction on Boiling Heat Transfer in a Plate Heat Exchanger
Lan Jiang (Kobe Univ.), Hitoshi Asano, Katsumi Sugimoto, Nobuyuki Takenaka
- B121** Condensation Heat Transfer of HFC Refrigerants for Plate Type Heat Exchangers
Takashi Okazaki (Mitsubishi Electric Co.ltd.), Tatsunori Man'o (Takasago Thermal Engineering Co. Ltd.)
- B122** The Experimental Study and Improvement of the Performance Characteristics of Roll Heat Pipe (RHP) with the Application in the Fusing Roller of Photocopy Machine
Masafumi Katsuta (Waseda Univ.), Ahmad Jalilvand, Koichiro Saito, Takeshi Fujinawa, Junya Toyonaga

Room C : Monday 23 October

Organized Session OS-2
Adsorption and Desiccant Refrigeration Systems
Organizer: Atsushi Akisawa (Tokyo Univ. of A&T),
Akio Kodama (Kanazawa Univ)

9:10~10:50 OS-2(1) [Chairperson: Yoshinori Hamamoto (Kyushu Univ.)]

- C101** Kinetic Modeling of Water Adsorption on HPA-Zeolite
Saepul Aep Uyun (Tokyo Univ. of A&T), Atsushi Akisawa, Tetsuji Iida, Takao Kashiwagi
- C102** Application of New Adsorbent to the Desiccant Air Conditioning System
Kazunori Oshima (MCRC), Tomomi Nakano, Hideto Hidaka, Masanori Yamazaki, Takahiko Takewaki, Hiroyuki Kakiuchi, Akio Kodama (Kanazawa Univ)
- C103** Improved Desiccant Cooling Process Equipped with Multi-partitioned Adsorbent / Enthalpy Wheels
Yuusuke Yamada (Kanazawa Univ.), Akio Kodama
- C104** Dehumidification using a Multipass Honeycomb Adsorber with an Internal Heat Exchange (Construction of a Mathematical Model and Improvement of the Dehumidifying Performance)
Yusuke Nakagawa (Kanazawa Univ.), Akio Kodama
- C105** Static Analysis of Desiccant Rotor (1st Report: Construction of Static Simulation Model and Investigation of Validity of the Model)
Hirotaka Mori (Waseda Univ.), Seiichi Yamaguchi, Kiyoshi Saito, Sunao Kawai, Masahiro Oka (Tokyo Gas Co.), Takashi Murakami, Hirofumi Sasaki, Naoki Onda

11:00~12:40 OS-2(2) [Chairperson: Atsushi Akisawa (Tokyo Univ. of A&T)]

- C106** Static Analysis of Desiccant Rotor (2nd Report: Effect of Structures and Operating Conditions on Performance of Desiccant Rotor)
Yamaguchi Seiichi (Waseda Univ.), Mori Hirotaka, Saito Kiyoshi, Kawai Sunao, Oka Masahiro (Tokyo Gas Co.), Murakami Takashi, Sasaki Hirofumi, Onda Naoki
- C107** Study on Multistage Desiccant Air-conditioning System Driven by Lower Heat Source Temperature
Yuto Shibao (Waseda Univ.), Seiichi Yamaguchi, Kiyoshi Saito, Sunao Kawai
- C108** Study on Optimum Operating Condition for Adsorbent Desiccant Rotor using Computer Simulation
Takuya Tsujiguchi (Kanazawa Univ.), Akio Kodama
- C109** Research on Residential Desiccant Ventilation System Utilizing Hot Water
Koji Fujishima (Saibu Gas Co.,Ltd), Hiroshi Okano (Seibu Giken Co.,Ltd), Wei-li Jin
- C110** Performance Estimation of a Solar Powered Adsorption Desiccant Cooling System Considering Hourly Variation of the Amount of Solar Radiation
Masashi Ohkura (Kanazawa Univ.), Akio Kodama

13:40~15:20 OS-2(3) [Chairperson: Akio Kodama (Kanazawa Univ.)]

- C111** Study on Energy Saving Air-conditioning System using Compact Desiccant Ventilation Units (Part 3 : Effect of Adsorption Isotherm and Particle Size on Adsorption Behavior of Desiccant Fixed Bed Units)
Masazumi Godo (Shin Nippon Air Technologies Co. Ltd), Kunio Miura, Yutaka Watanabe, Toshihiko Ishizawa, Noriomi Okazaki, Takeshi Takatsuka
- C112** Study on Energy Saving Air-conditioning System using Compact Desiccant Ventilation Units (Part 4 : Overall Heat and Mass Transfer Coefficient of Adsorbent Packed Beds)
Yoshinori Hamamoto (Kyushu Univ.), Hideo Mori, Masazumi Godo (Shin Nippon Air Technologies Co. Ltd), Kunio Miura, Yutaka Watanabe, Toshihiko Ishizawa, Noriomi Okazaki, Takeshi Takatsuka

- C113** Study on Energy Saving Air-conditioning System using Compact Desiccant Ventilation Units (Part 5 : Numerical Investigation of Heat and Mass Transfer in a Desiccant Bed)
Masahiro Kondo (Tokyo Univ. of A&T), Atsushi Akisawa, Takao Kashiwagi, Masazumi Godo(Shin Nippon Air Technologies Co. Ltd), Kunio Miura , Yutaka Watanabe, Toshihiko Ishizawa, Noriomi Okazaki, Takeshi Takatsuka
- C114** Study on Energy Saving Air-conditioning System using Compact Desiccant Ventilation Units (Part 6 : experimental Syudy on Adiabatic Adsorption and Desorption Processes)
Yutaka Watanabe (Shin Nippon Air Technologies Co. Ltd), Kunio Miura, Toshihiko Ishizawa, Masazumi Godo, Noriomi Okazaki, Takeshi Takatsuka
- C115** Study on Energy Saving Air-conditioning System using Compact Desiccant Ventilation Units (Part 7 Thermal Efficiency of Heat Regenerator by Simulation and Experiment)
Takeshi Takatsuka (Shin Nippon Air Technologies Co., Ltd.), Noriomi Okazaki, Kohichi Hirose (Iwate Univ.), Toshihiko Ishizawa (Shin Nippon Air Technologies Co., Ltd.), Masazumi Gohdo, Yutaka Watanabe, Kunio Miura

15:30~17:10 OS-2(4) [Chairperson: Bidyut B. Saha (Kyushu Univ.)]

- C116** Advanced Three-stage Adsorption Chiller using Re-heat Scheme
M.Z. I. Khan (Tokyo Univ. of A & T), B.B. Saha (Kyushu Univ.), T. Miyazaki (Tokyo Univ. of A & T), A. Akisawa, T. Kashiwagi
- C117** A Mechanism Desin and Cold Heat Output of an Adsorption Refrigerators.
Ikki Andou (Nagoya Univ.), Yasuki Hirota, Noriyuki Kobayashi
- C118** Optimization of Single Stage Adsorption Chiller Design using Particle Swarm Optimization
Takahiko Miyazaki (Tokyo Univ. of Agr. & Tech.), Atsushi Akisawa, Takao Kashiwagi, Akira Akahira (Aomori Industrial Research Center)
- C119** Study on Single and Two-stage ACF/Ethanol based Adsorption Cooling Systems
Anutosh Chakraborty (Kyushu Univ.), Bidyut B. Saha, Ibrahim I. El-sharkawy, Shigeru Koyama, Kim Choon Ng (National Univ. of Singapore, SINGAPORE)
- C120** Numerical Analysis of Double-Effect Adsorption Cycle
Saepul Aep Uyun (Tokyo Univ. of A&T), Atsushi Akisawa, Takao Kashiwagi

General Session GS-2 Hydrogen Energy Application Technology

17:20~18:20 GS-2 [Chairperson: Tomohiko Yamaguchi(Nagasaki Univ.)]

- C121** Performance Evaluation of Unitized Reversible Cell
Atsushi Kato (Takasago Thermal Eng.), Hitoshi Inaba, Atsushi Takahashi, Takanori Oku (Daiki Eng.), Hiroyuki Takano, Naokazu Kumagai, MAkoto Akai, Hiroshi Ito (AIST), Tsutomu Ioroi
- C122** The Optimum Design of Hydrogen Storage and Purification System by using Metal Hydride
Takuki Nakamura (Waseda Univ.), Koichiro Furusawa, Kazuhiro Yamakawa, Takeshi Fujinawa
- C123** Heat Transfer Enhancement of Metal Hydride Bed using Carbon Fiber
Yukino Matuisi (Saga Univ.), Takayuki Tanae, Sang-chul Bae, Masanori Monde, Masahumi Katuta (Waseda Univ.)
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Room A : Tuesday 24 October

Organized Session OS-10
Refrigeration Techniques of Food & Organic Material
Organizer: Toru Suzuki (Tokyo Univ. of MS & T)
Manabu Watanabe (Tokyo Univ. of MS & T)

9:10~10:50 OS-10(1) [Chairperson: Toru Suzuki (Tokyo Univ. of MS & T)]

- A201** Development of the New Micromanipulation System for Frozen Organisms
Tomoaki Inoue (The Univ. of Tokyo), Jun Ninomiya, Ken Kudoh-ichi, Toshiro Higuchi
- A202** Suppression of Freeze Denaturation of Myofibril by Sugar
Chunhong Yuan (Hokkaido Univ.), Shunsheng Chen (Shanghai Fisheries Univ.), Yudong Cheng, Peigen Zhou, Kunihiko Konno (Hokkaido Univ.), Yutaka Fukuda (National Fisheries Univ.)
- A203** Influence of Pre-treatment Methods of Fish Muscle on the Cryostability of Myofibrillar Protein During Frozen Storage.
Yutaka Fukuda (National Fisheries Univ.), Emiko Okazaki (National Research Institute of Fisheries Science), Ritsuko Wada (National Fisheries Univ.)
- A204** Influence of Glass Transition on Metmyoglobin Formation in Bluefin Tuna During Frozen Storage
Chotika Viriyarattanasak (Tokyo Univ. of Marine Science and Technology), Manabu Watanabe, Toru Suzuki
- A205** Threshing and Utilization for Processing of Flattened Adductor of Scallop from Frozen Shell.
Masao Yamazaki (Tokyo Univ. of Agri. Dept. of Food Sci.), Shou Nakamura, Shun Oana, Yoshihiko Iwasaki (Kiyomoto Co.,ltd.)

11:00~12:20 OS-10(2) [Chairperson: Manabu Watanabe (Tokyo Univ. of MS & T)]

- A206** Measuring Technique of Bubble Size Distributions in Ice Cream
Yuriko Sakamoto (Nihon Univ.), Moe Hirano, Gab-soo Do, Yasuyuki Sagara (Tokyo Univ.), Ken-ichi Kudoh, Yeong-hwan Bae (Suncheon National Univ, Korea), Hirofumi Kawanishi (Nihon Univ.), Toshiro Higuchi (Tokyo Univ.)
- A207** Measuring Technique of Bubble Size Distributions in Dough
Hikaru Shirota (College of Bioresource Sciences, Nihon Univ.), Kyouheii Akabayashi, Gab-soo Do, Tatsuro Maeda (Nisshin Seifun Group Inc), Junichi Sugiyama (National Food Research Institute), Mizuki Tsuta, Yasuyuki Sagara (Graduate School of Agricultural and Life Sciences, The Univ. of Tokyo)
- A208** Factors Affecting the Changes of Ice Crystals in Ice Cream (Quantitative Evaluation of Ice Crystal Formation by using Fractal Analysis)
Xin Wang (Tokyo Univ. of Marine Science and Technology), Manabu Watanabe, Toru Suzuki
- A209** Development of Evaluation Method for the Performance of Innovative Freezers
Motoki Okoshi (Tokyo Univ. of Marine Science and Technology), Manabu Watanabe, Toru Suzuki

Organized Session OS-4
Stirling Type Refrigerating Machine
Organizer: Noboru Kagawa (National Defense Academy),
Toshio Otaka (TMCT)

13:30~14:30 OS-4(1) [Chairperson: Hiroshi Sekiya (AIST)]

- A210 [Keynote]** Basic Performance of Stirling Coolers
Noboru Kagawa (National Defense Academy)
- A211 [Keynote]** New Development in Small Capacity Refrigeration
Nobutoshi Tezuka (GCJ), David M. Berchowitz (Global Cooling Bv)

14:40~15:40 OS-4(2)

[Chairperson: Takeshi Hoshino (JAXA)]

A212 Study on a House Hold Stirling Refrigerator

Toshio Otaka (TMCT), Syu Ogasawara (Tokyo Metro. Univ.), Masahito Ota

A213 Development of 80W Type Stirling Cooler SC-TD08

Takeshi Suzuki (Twinbird Corp.)

A214 A Basic Study of Cryosurgery and Hyperthermia System Utilizing Stirling Cooler

Daishi Takahashi (Nagaoka Univ. of Technology), Haruki Nakamura, Kazuya Sone (Twinbird Corp.), Kazufumi Shinoda (Nagaoka Univ. of Technology), Ichiro Fukumoto

Room B : Tuesday 24 October

Organized Session OS-8

Technological Development in Heat Exchangers

Organizer: Hideo Mori (Kyushu Univ.),
Akio Miyara (Saga Univ.)

9:00~10:20 OS-8(6)

[Chairperson: Shiro Kakiyama (Sumitomo Light Metal, Ltd.)]

B201 Two-phase Flow Visualization of Refrigerant Fluid at Expansion Valve with a New Throttle Design

Kazuhiko Matsumura (Pacific Industrial Co., Ltd), Yasuhiko Fujii, Shigeo Kimura (The Univ. of Kanazawa), Takayuki Saito (The Univ. of Shizuoka), Takahiro Kiwata (The Univ. of Kanazawa)

B202 Performance Evaluation of Refrigerant Distributor for Air Conditioner

Shun Yoshioka (Daikin Air-conditioning and Environmental Laboratory), Hyunyoung Kim, Kazushige Kasai

B203 Prediction of Pressure Loss of Herringbone Micro Fin Tube

Akio Miyara (Saga Univ.), Afroz M.M. Hasan, Yosuke Higuchi

B204 Study on Pressure Loss of the Slurry of Nonadecane Particles and Water

Hiroya Hasegawa (Chiba Univ.), Makoto Ono, Makoto Hishidah, Gaku Tanaka

Workshop WS-1

Present-status & Development in Heat Exchangers

10:30~12:20 WS-1(1)

[Chairperson: Hideo Mori (Kyushu Univ.)]

B205 [Keynote] Technical Seeds Survey on Heat Exchanger Technology for Refrigerating and Air-conditioning Systems (Summary Report of Subcommittee for Heat Exchanger Technology)

Sigeru Koyama (Kyushu Univ.), Hideo Mori, Norio Sawada (Sanyo Electric Co., Ltd.)

B206 Performance Improvement of Outdoor Heat Exchanger for Air Conditioners

Yoshiaki Nagaoka (Toshiba Carrier Corp.)

B207 Performance Improvement of Gas Engine Driven Heat Pump Air-conditioner and Applied Heat Exchangers

Sadayasu Nakano (Sanyo Electric Co., Ltd.)

B208 Study on Selection of the Crossing Fin Tube Heat Exchanger based on Types of Products

Yukio Innami (Hitachi Appliances, Inc.), Chieko Kondou

B209 Development of Heat Exchangers Working with Natural Refrigerants

Mugabi Nelson (Mayekawa Mfg. Co. Ltd.)

13:20~15:10 WS-1(2)

[Chairperson: Hideo Mori (Kyushu Univ.)]

B210 [Keynote] Performance Evolution of Inner Grooved Tube

Naoe Sasaki (Sumitomo Light Metal Industries, Ltd.)

B211 Research of Efficient Design Method on Heat Exchanger for Air Conditioner

Kaijian Wang (Fujitsu General Institute of Air-conditioning Technology Ltd.), Masaharu Fukaya, Guoliang Ding (Shanghai Jiaotong Univ.), Jian Liu (Fujitsu General Ltd.)

- B212** Trend on the Next Generation Heat Exchangers
Sigharu Taira (Daikin Industries, Ltd.)
- B213** Prediction of Capacity of a Heat Exchanger
Kunihiko Kaga (Mitsubishi Electric Corp.)
- B214** Technology of the Indoor Compact Heat Exchanger
Shoichi Yokayama (Matsushita Electric Industrial Co., Ltd.)

Organized Session OS-8
Technological Development in Heat Exchangers
Organizer: Hideo Mori (Kyushu Univ.),
Akio Miyara (Saga Univ.)

- 15:20~16:20 OS-8(7) [Chairperson: Ken Kuwahara (Kyushu Univ.)]
- B103** Performance Evaluation of Prototype Microchannel Evaporator for the Residential Air-Conditioner
Honggi Cho (Sungkyunkwan Univ., KOREA), Keumnam Cho
- B104** R-22 Vaporization in a Flat Extruded Aluminum Multi-Port Tube
N.H. Kim (Univ. of Incheon, KOREA), S.P. Han, T.G. Park
- B114** Experimental Studies on the Evaporative Heat Transfer Characteristics of CO₂ in Smooth and Micro-fin Tubes with Outer Diameters of 5 and 9.52 mm
J.M. Cho (Seoul National Univ., KOREA), J.S. Lee, M.S. Kim

Room C : Tuesday 24 October

Organized Session OS-9
Heat and Mass Transfer with Solid-Liquid Phase Transformation
Organizer: Masashi Okada (Aoyamagakuin Univ.),
Koji Matsumoto (Chuo Univ.)

- 9:00~10:30 OS-9(1) [Chairperson: Koji Matsumoto (Chuo Univ.)]
- C201 [Keynote]** Thermal Properties of Water (ice) Involved in Adsorbent
Yoshio Hirasawa (Univ. of Toyama)
- C202** Consideration on Measurement of Latent Heat of Aqueous Solutions using DSC
Tatsunori Asaoka (Tokyo Tech.), Hiroyuki Kumano, Akio Saito, Seiji Okawa
- C203** A Study on Improvement of Production Rates of Propane Hydrate with Ice Particle
Shunsuke Kaji (Aoyama Univ.), Masashi Okada, Yosikazu Teraoka
- C204** Effect of Surface Physical Property and Crystal Orientation on Ice Crystal Growth on the Solid Surface
Hirokazu Tanaka (Aoyamagakuin Univ.), Masashi Okada, Yoshikazu Teraoka, Yusuke Higuchi (Hitachi)
- 10:40~12:00 OS-9(2) [Chairperson: Yoshio Hirasawa (Univ. of Toyama)]
- C205** Ice Formation in the Presence of Natural Convection Due to Cooled Vertical Surface
Michael Vynnycky (Kanazawa Univ.), Shigeo Kimura (Kanazawa Univ.), Shingo Hidaka
- C206** Combined Convection Heat Transfer with Melting of Ice in Horizontal Tubes Immersed in Working Fluid (Consideration of Heat Conduction at Tube Wall)
Koichi Hirose (Iwate Univ.), Junichi Hatakeyama (MEC.), Tomoaki Abe (SMC Co.)
- C207** Formation of Ice Slurry by Using W/O Emulsion (Promotion of Dissolution Rate of Supercooling due to Voltage Impression)
Kazuki Sakae (Chuo Univ.), Koji Matsumoto
- C208** Operation Data of Falling Film Type of Freeze Concentration Equipment
Naonori Kuroda (Shin Nippon Air Technologies Co., Ltd)

- 13:00~14:20 OS-9(3) [Chairperson: Masashi Okada (Aoyamagakuin Univ.)]
C209 Ice Crystals Produced from Water Containing Microbubbles
Tomohiko Hatakeyama (Tsukuba Univ.), Takaaki Inada (AIST), Fumio Takemura
C210 Growth of Gas Bubbles and Columns at Ice-water Interface at High Pressure (1st Report: Observation of Oxygen Gas Bubbles and Columns)
Kenji Yoshimura (Fukuoka Ind. Tech. Cent.), Takaaki Inada (AIST), Shigeru Koyama (Kyushu Univ.)
C211 Growth of Gas Bubbles and Columns at Ice-water Interface at High Pressure (2nd Report: Analysis of Shape and Size of Gas Columns)
Takaaki Inada (AIST), Kenji Yoshimura (Fukuoka Ind. Tech. Cent.), Shigeru Koyama (Kyushu Univ.)
C212 Study on Ice Layer Separation by Gas Bubbles Generated by Electrolysis
Fumihiro Ohno (Chiba Univ.), Saburo Nishimura, Makoto Hishida, Gaku Tanaka

Workshop WS-2
New Development in Ammonia Technology

- 14:30~16:10 WS-2 [Chairperson: Masao Goto (Tokyo Univ. of MS & T)]
C213 Avert Treatment Method for Accidental Leakage of Ammonia Air Conditioning and Refrigeration Systems
Hironori Nakai (Mayekawa Mfg. Co. Ltd)
C214 Inverter Driven 2stage Screw Refrigerator for NH₃
Noboru Tsuboi (Kobe Steel Ltd), Katsuyuki Suzuki
C215 Introduction of Cooling Systems Working with NH₃ at Various Temperature Ranges.
Iwao Terashima (Mayekawa Mfg. Co., Ltd)
C216 Recovery and Liquefaction System of Fiber Processing Ammonia by High Pressure Method
Kazuhiko Matsuura (Mayekawa Mfg. Co., Ltd)
C217 Development of a Small CO₂/NH₃ System for the Cold Storage
Takeshi Takeda (Toyo Engineering Works.ltd)

Room D : Tuesday 24 October

Organized Session OS-7
Present-status & Future Development in Compressors
Organizer: Kenji Tojo (Hitachi Appliances, Inc.),
Mitsuhiro Fukuda (Shizuoka Univ.)

- 9:00~10:30 OS-7(1) [Chairperson: Kenji Tojo (Hitachi Appliances, Inc.)]
D201 **[Keynote]** Current Status of Lubricant for CO₂ Refrigerant
Masato Kaneko (Idemitsu Kosan Co.,Ltd)
D202 Refrigerant Concentration Measurement in Compressor Oil Sump
Masao Shimasaki (Shizuoka Univ.), Mitsuhiro Fukuda, Tadashi Yanagisawa, Yasuhiro Ogi
D203 Development of Oil Level Simulation for Plural Compressors System
Takashi Kaneko (Samsung Yokohama Research Institute), Michiyoshi Kusaka
D204 Visual Techniques to Quantify Behavior of Oil Droplets in a Scroll Compressor
Toshiyuki Toyama (Daikin Industries, Ltd.), Hideki Matsuura, Yoshiaki Yoshida

- 10:40~12:00 OS-7(2) [Chairperson: Toshiyuki Toyama (Daikin Industries, Ltd.)]
D205 Development of Wear-reducing Technologies in Rotary Compressor using Natural Refrigerant CO₂
Hideto Nakao (Mitsubishi Electric Corp.), Hideaki Maeyama, Tomoo Takayama

- D206** An Experimental Study of Lubrication Characteristics at Thrust Slide-Bearing of Scroll Compressors
Tatsuya Oku (Osaka Electro-communication Univ.), Noriaki Ishii, Keiko Anami (Ashikaga Institute of Technology), Ichiro Nagasawa (Osaka Electro-communication Univ.), Kiyoshi Sawai (Matsushita Electric Industrial Co., Ltd.), Noboru Iida, Yoshiyuki Hutagami, Atsushi Sakuda
- D207** A Theoretical Study of Lubrication Mechanism at Thrust Slide-bearing of Scroll Compressors
Tatsuya Oku (Osaka Electro-communication Univ.), Noriaki Ishii, Keiko Anami (Ashikaga Institute of Technology), Kiyoshi Sawai (Matsushita Electric Industrial Co., Ltd.), Takashi Morimoto, Hirofumi Yoshida, Akira Hiwata, Daisuke Hunakoshi
- D208** Mixed Lubrication Analysis in Rotary Compressors
Kazuhisa Sumida (Toshiba Carrier), Kazuhiko Miura, Yasutaka Itoh (Toshiba), Hitoshi Hattori

13:00~14:20 OS-7(3) [Chairperson: Noriaki Ishii(Osaka Electro-communication Univ.)]

- D209** The Vibration Characteristics of the Lead Valve and Frow Analysis around the Valve in a Compressor for Automotive Air-Conditioner
Taizo Sato (Sanden Corp.), Tetsuhiro Tsukiji (Sophia Univ.), Eitaro Koyabu, Yoshito Matsumura (Sanden Corp.)
- D210** Orbiting Compressor for Residential Air-Conditioners
H.J. Kim (Univ. of Incheon, KOREA), J.H. Shim, T.H. Kwon
- D211** Analytical Model for Starting Characteristics of Vane Compressor
Yusuke Osawa (Shizuoka Univ.), Mitsuhiko Fukuda, Tadashi Yanagisawa
- D212** Prediction Technique of Performance in R410A Two-Stage Rotary Compressor
Hiroshi Maita (Mechanical Engineering Research Laboratory, Hitachi, Ltd.), Atsushi Kubota, Atsushi Ohnuma (Hitachi Appliances, Inc.), Tetsuya Tadokoro

General Session GS-1 Heat Pump & Air-conditioning Systems

14:30~16:10 GS-1(1) [Chairperson: Nobuya Nishimura(Osaka City Univ)]

- D213** Effect of Applying Thermoelectric Conversion modules to Cogeneration Systems
Shigeki Kametani (Tokyo Univ. of Marine Science and Technology), Toshihiko Fujita, Takenobu Kajikawa (Shonan Institute of Technology), Kenjiro Yamaguti (Engineering Advancement Association of Japan)
- D214** A Monitoring and Assessment for Energy System of Public Facility with Co-Generation System
Hiroshi Onoda (Waseda Univ.), Katsuya Nagata, Hiroyuki Yamasaki, Daiki Taguchi, Naoya Okamoto
- D215** Development of a Design and Performance Prediction Tool for the Ground Source Heat Pump System and Its Application
Takao Katsura (Hokkaido Univ.), Katsunori Nagano, Sayaka Takeda
- D216** Development of Snow Melting System with Ground Source Heat Pumps
Sayaka Takeda (Hokkaido Univ.), Katsunori Nagano, Takao Katsura
- D217** Development of High Efficiency Heating Tower
Masahiro Inoue (Kukenkogyo Co.,ltd.), Kazutaka Kurashige (Tokyo Electric Power Co.inc.), Tatsuo Sanma (Chubu Electric Power Co.inc.), Satoshi Ujiie (Kansai Electric Power Co.inc.)

Special Lecture

16:30~17:40 SL1 [Chairperson: Shigeru Koyama(Kyushu Univ.)]

- SL1** Refrigeration Technology — Past and Present
Lecturer: Toyoaki Kawai (Kawai Freezer/Cooler Ice & Cold Storage Co., Ltd.)

Room A : Wednesday 26 October

Organized Session OS-11
Frost, Snow & Ice Application Technologies
Organizer: Nobuo Shimomura (NNCT),
Mitsuo Seki (Toyo Engineering Works)

9:00~10:10 OS-11(1) [Chairperson: Nobuo Shimomura
(Niihama National College of Technology)]

- A301 [Keynote]** Flow and Heat Transfer Characteristics of Phase Change Materials Mixture such as Ice Slurries
Akihiko Horibe (Okayama Univ.)
- A302** Study on Fluid Latent Heat Storage Material using Eutectic Point
Hidetoshi Ohkubo (Tamagawa Univ), Hiromiti Murakoshi, Mitsuo Seki (Toyo Engineering Works), Taku Hokamura, Hideaki Obana
- A303** Study on Effect of Cooling Surface Temperature on Frosting Phenomena
Hidetoshi Ohkubo (Tamagawa Univ), Masahiro Matsumura, Masayuki Ueno

10:20~11:40 OS-11(2) [Chairperson: Akihiko Horibe (Okayama Univ.)]

- A304** Numerical Analysis in Frost Layer under Natural Convection (Effects of Air Side Factors)
Nobuo Shimomura (Niihama National College of Technology), Mitsuo Seki (Toyo Engineering Works), Hidetoshi Ohkubo (Tamagawa Univ), Masahiro Matsumura
- A305** Numerical Analysis in Frost Layer under Natural Convection (Effects of Cooling Surface Factors)
Mitsuo Seki (Toyo Engineering Works), Nobuo Shimomura (Niihama National College of Technology), Hidetoshi Ohkubo (Tamagawa Univ), Masahiro Matsumura
- A306** Adhesion Prediction of Frost in the Refrigerator by Fluid and Heat Transfer Analysis (Prediction Method During Defrost Operating)
Katsunori Horii (MEI), Nobuo Shimomura (NNCT)
- A307** Numerical Analysis of the Frost Profile on Cooling Plates by Forced Convection
Chieko Kondou (Hitachi Appliances, Inc.), Shigeru Koyama (Kyusyu Univ.), Takao Senshu (Yamaguchi Univ.), Kensaku Oguni (Hitachi Appliances, Inc.)

12:40~14:20 OS-11(3) [Chairperson: Mitsuo Seki (Toyo Engineering Works,ltd)]

- A308** Development of the Freeze Mold Casting Method
Hideki Shudai (Mayekawa Manufacturing Co.,ltd), Nobuo Tokunaga, Matuyuki Nisikawa, Yosinobu Fukuda
- A309** Frozen Characteristics of Mold Casting Sand by Cold Air
Akihiko Horibe (Okayama Univ.), Hideo Inaba, Naoto Haruki, Tetsuya Moriyasu
- A310** Heat Transfer Enhancement of Artificial Ground Freezing
Hiroshi Souma (Chemical Grouting Co.,ltd.)
- A311** Development of a Freeze Concentration System for Food Products
Takahiro Akizuki (Mayekawa Mfg.co., Ltd.), Hiroyasu Ohira
- A312** Snow and Ice Fire Extinguishing System with Adherent Ice Particles
Kazuya Matsuo (Toyo Engineering Works,ltd), Hiroshi Endo, Mitsuo Seki, Hideaki Obana, Kouichi Tamakoshi (Tokyo Fire Department), Shohei Nemoto, Akihiko Iida

Organized Session OS-3
Absorption Heat Pump Cycle
Organizer: Yoshiharu Amano (Waseda Univ.),
Atsushi Tsujimori (Kanto Gakuin Univ.)

14:30~16:10 OS-3(1) [Chairperson: Kiyoshi Saitou (Waseda Univ.)]

A313 Canceled

A314 Investigation on Solution-Pump Error Control at Starting-up of an Ammonia-Absorption Refrigerator — Effect of Vapor Generation Timing —
Takeshi Odagaki (Waseda Univ.), Kinoshita Yasuyuki, Takeshita Keisuke, Amano Yoshiharu, Hashizume Takumi, Takei Toshitaka (Daikin Industries, Ltd.)

A315 Canceled

A316 Experimental Study on Absorption Heat Transfer of LiBr Solution on Smooth and Enhanced Finned Tubes.
Hiroyuki Takahashi (Kobelco & Materials Copper Tube, Ltd.), Shigeru Koyama (Kyushu Univ.)

A317 Performance of Vertical Plate-type and Horizontal Tube-type Equipments as Generator and Absorber
Yoshiaki Hyodo (Ehime Univ.), Suehiro Ryoji, Kouji Noda, Kenji Kawasaki, Akira Matsuda, Katumi Honda (Kyushu Univ.)

16:20~18:00 OS-3(2) [Chairperson: Yoshiharu Amano (Waseda Univ.)]

A318 Examination of Plate-type Generator of Absorption Refrigeration Cycle without a Solution Pump
Hiroyuki Yabune (Kanto Gakuin Univ.), Masashi Kato, Atsushi Tsujimori, Kosuke Hirata, Masashi Sonoda

A319 Remote Monitoring Capability using Local Area Network for Absorption Heat Pump System
Yonezo Ikumi (Sanyo Electric Co., Ltd), Kazuyasu Iramina, Siguma Yamazaki, Takao Tanaka (Shibaura Institute of Technology), Hidehiko Ichikawa (Ntt Data Sanyo System Corp.)

A320 Experimental Investigation of Heat Transportation based on the Principle of Absorption Cycle
Sotaro Kashiwa (Tokyo Univ. of A&T), Taiki Yoshimura, Atsushi Akisawa, Takao Kashiwagi

A321 Performance Evaluation of Triple-effect Absorption Cycles
Makoto Otani (Waseda Univ.), Kiyoshi Saitou, Sunao Kawai

A322 Characteristics Evaluation of Absorption Type Dehumidifier using Aqueous LiCl Solution under Actual Operating Conditions
Jun Ide (Waseda Univ.), Syunichirou Matsushita, Seiichi Yamaguchi, Kiyoshi Saito, Sunao Kawai

Room B : Wednesday 26 October

General Session GS-1
Heat Pump & Air-conditioning Systems

9:00~10:40 GS-1(2) [Chairperson: Masafumi Hirota (Nagoya Univ.)]

B301 Study of the Medium-scale Heat Pump System using Capillary Tube
Akira Uehara (Waseda Univ.), Keisuke Takayama, Kazuki Haraguchi, Takumi Hashizume, Yoshiharu Amano, Michio Sasaki (MYCOM)

B302 Development of Energy Conservation System by Separating Dehumidification in Air-conditioning (Part 1 Outline and System Constitution)
Yasuo Iguchi (Shin Nippon Air Technologies), Takashi Shimura, Kunio Miura

B303 Development of Energy Conservation System by Separating Dehumidification in Air-conditioning (Part 2 Development Status of System Constitution)
Takashi Shimura (Shin Nippon Air Technologies), Yasuo Iguchi, Kunio Miura

B304 A Study on Energy-saving in Vending Machine Operation (Development of Best Available Allocation Supporting Tool)
Katsuya Nagata (Waseda Univ.), Hiroshi Onoda (Wei), Isao Hasegawa (Waseda Univ.), Shinji Yamashita

- B305** A Measurement Report on the Effects of Energy-saving Control by PLC in Constant Temperature and Humidity Room
Okazaki Noriomi (Shin Nippon Air Technologies Co. Ltd), Eiji Shamoto (Nagoya Univ.), Norikazu Suzuki

10:50~12:30 GS-1(3) [Chairperson: Yasuo Iguchi (Shin Nippon Air Technologies)]

- B306** Study on Annual Performance of Multi-air-conditioner for Buildings (Evaluation of Current Prediction Method)
Masahide Furukawa (Nagoya Univ.), Masafumi Hirota, Choyu Watanabe (Chubu Electric Power), Katsuaki Nagamatsu, Toshinori Sugawara
- B307** Study on Annual Performance of Multi-Air-Conditioner for Buildings (Analyses of Energy-saving Performance and Impact on Environment)
Masahide Furukawa (Nagoya Univ.), Masafumi Hirota, Choyu Watanabe (Chubu Electric Power), Katsuaki Nagamatsu, Toshinori Sugawara
- B308** Analysis of Energy Demand and Supply Data in Univ. of Yamanashi
Yoichi Shimazaki (Univ. of Yamanashi)
- B309** Air-Conditioning System in Urban Area Concerning Heat Island Problem (2nd Report : dynamic Simulation of Air Cooled Air Conditioner)
Naruaki Shinomiya (Osaka City Univ), Nobuya Nishimura, Hiroyuki Iyota, Tomohiro Nomura
- B310** Performance Analysis of an Integrated Heat Pump Unit with Combined Heat Source for Low Energy House
Katsunori Nagano (Hokkaido Univ.), Atsushi Tsuchiya, Takao Katsura, Sayaka Takeda

Organized Session OS-6
Database of New Generation Refrigerants
Organizer: Yukihiro Higashi (Iwaki Meisei Univ.),
Hidehiko Ichikawa (NTT Data Sanyo System Corp.)

13:20~15:10 OS-6(1) [Chairperson: Noboru Kagawa
(National Defence Academy of Japan)]

- B311** [Keynote] Program Package for Thermophysical Properties of Fluids: Propath Ver.13.1
Ryo Akasaka (Kyushu Lutheran College)
- B312** Programs Providing Thermodynamic Properties of Refrigerants (Fluorocarbons and Natural Refrigerants)
Noboru Kagawa (National Defence Academy of Japan), Hidehiko Ichikawa (NTT Data Sanyo System Corp.), Yoshihiro Udagawa (Oaksetsubi Corp.)
- B313** Utilization of Refrigerant Database in Refrigerator Design
Hiroshi Aoki (Sanyo Electric Co.,Ltd.), Junichi Kubota, Takaya Tateno, Kiyoshi Katagai, Hidehiko Ichikawa (NTT Data Sanyo System)
- B314** Development of Auto Select Program of Refrigerator and Piping That Correspond to R404A
Satoshi Tabei (Sanyo Electric Co.,Ltd.)
- B315** Industrial Use of Refrigerant Properties
Nobuo Tanaka (Hisaka)

15:20~16:40 OS-6(2) [Chairperson: Hiroyuki Miyamoto (Keio Univ.)]

- B316** Development of Correlatoin for Transport Properties of HFC Refrigerant Mixtures
Noboru Kagawa (National Defense Academy)
- B317** Calculation Procedure of Saturation Pressure using the Helmholtz Function Type Equation of State
Ryo Akasaka (Kyushu Lutheran College)
- B318** Uncertainty Evaluation of Equations of State for Carbon Dioxide
Yohei Kayukawa (Aist), Kennichi Fujii

- B319** R12, R134a and R152a: Correlation of Their Thermodynamic Properties and Comparisons of Performance Indicators When Used in an Ideal Vapor Compression Cycle
G.A. Catubao (Eastern Visayas State Univ., PHILIPPINS), N.A. Catubao, D.Y. Mancao Jr.

Organized Session OS-5
Measurement and Properties of New Refrigerants
Organizer: Yohei Kayukawa (AIST),
Ryo Akasaka (Kyushu Lutheran College)

- 16:50~18:30 OS-5 [Chairperson: Yohei Kayukawa (AIST)]
- B320** Precise Measurements of the Thermodynamic Properties for Hydrocarbon Refrigerant n-Butane in High Temperatures and Pressures
Hiroyuki Miyamoto (Keio Univ.), Kenji Shigetoyo, Masahiko Uematsu
- B321** Measurements of the VLE Properties for the R290 + R600a + R32 Mixture
Katsuyuki Tanaka (Iwaki Meisei Univ.), Yukihiro Higashi, Yohei Kayukawa (AIST), Kenichi Fujii
- B322** Measurements of the Surface Tension for the Binary R290 + R600a Mixture
Katsuyuki Tanaka (Iwaki Meisei Univ.), Yukihiro Higashi, Masaaki Okada (Tsukuba Univ. of Tech.)
- B323** Study on Specific Heat Capacity Measurements of Alternative Refrigerants and Natural Refrigerants (Isochoric Specific Heat Capacity of R410A and Carbon Dioxide)
Yu Kondo (NDA), Atsushi Matsuguchi, Noboru Kagawa
- B324** Vapor Pressure Properties of Alkali Metal Acetate Solution
Daisuke Hoshino (Tokyo Metropol. Univ.), Hirohisa Yoshida, Kazuhiko Murakami, Masahiro Ota, Shuzo Ohe (Sci. Univ. Tokyo)

Room C : Wednesday 26 October

Panel Discussion
Quality of Frozen Food and Its Control Technology

- 9:00~11:00 PD(1) [Chairperson: Yutaka Fukuda (National Fisheries Univ.)]
- C301** Structural Changes of Myosin Upon Freezing
Kunihiko Konno (Hokudai, Fisheries Faculty), Chunhong Yuan
- C302** Topics on the Changes of Pigment in Frozen Tuna Meat and the Technologies to Prevent Discoloration
Yoshihiro Ochiai (Univ. of Tokyo)
- C303** Lipid Deterioration and Its Prevention of Frozen Seafood
Toshiaki Oshima (Tokyo Univ. of Marine Science and Technology)
- C304** The Ultrastructural Changes and the Physical Properties in Frozen Carp Muscle under High Pressure Thawing
Keiko Yoshioka (Nakamura Gakuen Univ.)
- 11:10~12:40 PD(2) [Chairperson: Yutaka Fukuda (National Fisheries Univ.)]
- C305** Influence of Freezing Rate, Frozen Storage Temperature, Fracturation of Frozen Storage Temperature, and Thawing Rate on the Deterioration of Fish Muscle Quality
Yutaka Fukuda (National Fisheries Univ.)
- C306** Classification of Fresh and Frozen-thawed Fish
Emiko Okazaki (National Research Institute of Fisheries Science)
- C307** Improvement of Quality by New Loin Freezing Tuna
Ryoichi Hanzawa (Mayekawa Mfg.co.,ltd.), Yutaka Fukuda (National Research Institute of Fisheries Science)

Organized Session OS-7
Present-status & Future Development in Compressors
Organizer: Kenji Tojo (Hitachi Appliances, Inc.),
Mitsuhiro Fukuda (Shizuoka Univ.)

- 13:40~15:10 OS-7(4) [Chairperson: Takayoshi Fujiwara (Toshiba Carrier Corp.)]
- C308 [Keynote]** Natural Working Fluid: Current Status and Future Prospects (Updates from the 7th Iir Conference on Natural Working Fluids)
Toshikazu Ishihara (Sanyo Electric Co., Ltd.)
- C309** Two-stage Rotary Compressor for CO₂ Heat Pump Water Heater in Cold Regions
Tetsuhide Yokoyama (Mitsubishi Electric Corp.), Toshihide Koda, Shin Sekiya, Kei Sasaki, Hideaki Maeyama
- C310** Development of a 15MPa Compressor for CO₂ Heat Pump Systems.
Mizuo Kudo (Mayekawa Mfg.co.,ltd), Akihiro Kaneda (Chubu Electric Power Co.,inc), Ichirou Sakuraba, Cyoyu Watanabe, Hirokazu Yoneda (Mayekawa Mfg.co.,ltd), Yoshida Go
- C311** Development of Large Capacity Semi-Hermetic Screw Compressors
Masayuki Urashin (Hitachi Appliances,inc.), Eisuke Kato, Hiroo Watanabe, Hisashi Aoki, Mitsugu Taki-
naka, Yuji Mitsuyama

Compressor Technology Related Seminar, SN-2

- 15:20~16:50 SN-2 [Chairperson: Mitsuhiro Fukuda (Shizuoka Univ.)]
- C312** Technical History of Rotary Compressor
Takayoshi Fujiwara (Toshiba Carrier Corp.)
- C313** The Change of Inverter for a Compressor
Sumikazu Matsuno (Daikin Air-conditioning and Environmental Laboratory, Ltd.), Kazunobu Ohyama
- C314** Possibility of Two-phase Ejector in a Refrigerant Cycle
Masafumi Nakagawaa (Toyohashi Univ. of Thechnology)