5th Asian Conference on Refrigeration and Air Conditioning (ACRA 2010)

Green Breeze from Asia: Frontiers of Refrigerants, Heat Transfer and System

Tokyo, Japan
7-9 June 2010

Monday, June 7, 2010

Keynote Speech 1 (10:30-11:30)
Chair: Noboru KAGAWA (National Defense Academy of Japan)
Speaker: Momoki KATAKURA (President of JSRAE)

A1: Absorption and Adsorption Refrigeration 1 (13:00-14:40)
Chair: Nobuya NISHIMURA (Osaka City University)
A1-016 Study of a two stage air-cooled ammonia-water absorption refrigeration cycle for solar cooling system
Peng LIN, Ruzhu WANG, Zaizhong XIA, Institute of Refrigeration and Cryogenics, Shanghai Jiao Tong University, China
A1-017 Analytical investigation of a two-stage air-cooled absorber for solar cooling applications
Peng LIN, Ruzhu WANG, Zaizhong XIA, Institute of Refrigeration and Cryogenics, Shanghai Jiao Tong University, China
A1-023 Application of Ammonia-Water Absorption Cycle to Transfer Cooling and Heating at Ambient Temperature
Atsushi AKISAWA, Takahiko MIYAZAKI, Yuki UEDA, Institute of Symbiotic Science and Technology, Tokyo University of Agriculture and Technology, Japan
Kazumichi ARAKI, Graduate School of Bio-Applications and Systems Engineering, Tokyo University of Agriculture and Technology, Japan
Toshiba TAKAI, Waseda Research Institute for Science and Engineering, Waseda University, Japan
Wai Soong LOH, Kazi Afzalur RAHMAN, Anutosh CHAKRABORTY, Bidyut Baran SAHA, Kim Choon NG, Department of Mechanical Engineering, Faculty of Engineering, National University of Singapore, Singapore
Won Gee CHUN, Department of Nuclear and Energy Engineering, Cheju National University, Korea
A1-040 The Cycle Time Optimization of a Novel Dual Evaporator Type Three-Bed Adsorption Chiller
Takahiko MIYAZAKI, Yuki UEDA, Atsushi AKISAWA, Institute of Symbiotic Science and Technology, Tokyo University of Agriculture and Technology, Japan
Masato TAKAKI, Department of Mechanical Systems Engineering, Tokyo University of Agriculture and Technology, Japan

A2: Absorption and Adsorption Refrigeration 2 (15:00-16:20)
Chair: Atsushi AKISAWA (Tokyo University of Agriculture and Technology)
A2-051 Sorption Rate and Isotherms of Methane on Pitch-Based Activated Carbon using Volumetric Method
Wai Soong LOH, Kazi Afzalur RAHMAN, Bidyut Baran SAHA, Anutosh CHAKRABORTY, Kim Choon NG, Department of Mechanical Engineering, Faculty of Engineering, National University of Singapore, Singapore
Won Gee CHUN, Department of Nuclear and Energy Engineering, Cheju National University, Korea
A2-054 Experimental investigation on the performance of a waste heat-driven advanced desiccant dehumidifier without moving parts
Aung MYAT, Kim Choon NG, Hideharu YANAGI, Kyaw THU, Department of Mechanical Engineering, National University of Singapore, Singapore
Won Gee CHUN, Department of Nuclear and Energy Engineering, Cheju National University, Korea
A2-101 The effect of oil-droplet on the bubble absorption performance in a binary nanoemulsion
Young-Jin KIM, Jinki LEE, Yong Tae KANG, School of Mechanical and Industrial System Engineering, Kyung Hee University, Korea
A2-137 Development of a Compact Absorption Refrigerator Assisted by Low Temperature Level Heat Sources
**[Room 1]**

**B1: Effective Usage and Saving Energy 1 (13:00-14:20)**

Chair: Kuniaki KAWAMURA (Mayekawa MFG. Co., Ltd)

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Dmytro BUYADGIE, Oleksiy BUYADGIE, Igor VASILEV, Wilson Ltd., Ukraine  
Sergii NICHENKO, Vitaliy SECHENYH, Odessa State Academy of Refrigeration, Ukraine

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Fu Wing YU, Hong Kong Community College, PolyU, Hong Kong  
Kwok Tai CHAN, Department of Building Services Engineering, The Hong Kong Polytechnic University, Hong Kong

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Jin Taung LIN, Jih Hway LOU, Yew Khoy CHUAH, Department of Energy and Refrigerating Air-Conditioning Engineering, Taipei National University of Technology, Taiwan

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Jau-Huai LU, Chi-Hung LIN, Department of Mechanical Engineering National Chung Hsing University, Taiwan

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Chair: Yew Khoy Chuah (National Taipei University of Technology)

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Kuei Tien LIN, Kuo Hsiang CHIEN, Energy and Environment Laboratories, Industrial Technology Research Institute, Taiwan

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Yoichi SHIMAZAKI, Social System Engineering, Division of Engineering, Interdisciplinary Graduate School of Medical and Engineering, University of Yamanashi, Japan

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Peng LI, Wei CAO, Silian Intelligence Technology Share Co., Ltd., China

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MY CHAN, Department of Building Services Engineering, The Hong Kong Polytechnic University, Hong Kong

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**C1: Frost, Snow, Ice (13:00-14:40)**

Chair: Seiji OKAWA (Tokyo Institute of Technology)

**C1-048** Heat Transfer with Frosting Phenomena under Natural Convection 144  
Ryo YOSHIOKA, Hidetoshi OHKUBO, Department of Mechanical Engineering, Tamagawa University, Japan  
Sho INOUE, Graduate School of Engineering, Tamagawa University, Japan

**C1-049** Study on mass transfer with frosting phenomenon under natural convection 148  
Sho INOUE, Hidetoshi OHKUBO, Graduate School of Engineering, Tamagawa University, Japan

**C1-050** Effect of initial ice formation near a cooling surface on progressive freeze-concentration process 153  
Yoshikazu TERAOKA, Ryo FUKUNO, Koji MATSUMOTO, Department of Precision Mechanics, Faculty of Science and Engineering, Chuo University, Japan
C1-001 Effect of Several Parameters on Frost Growth in Low Temperature Environments

Koji YAMASHITA, Air-Conditioning & Refrigeration Systems Works, Mitsubishi Electric Corporation, Japan
Hidetoshi OHKUBO, Department of Mechanical Systems, Tamagawa University, Japan

C1-052 Frost Properties on Cold Surface Simple Geometries

Yoon Suk LEE, Shin Hyuk YOON, Graduate school, Sungkyunkwan University, Korea
Gaku HAYASE, System Appliances Division, Samsung Electronics Co., Ltd., Korea
Keumnam Cho, School of Mechanical Engineering, Sungkyunkwan University, Korea

C2-003 Effect of Sublimation of Ice on Evaporation Phenomenon of Ethanol Solution

Tatsunori ASAOKA, Masashi OKADA, Kazuki AIDA, Department of Mechanical Engineering, Aoyama Gakuin University, Japan

C2-044 Study on Tetradecane Nano-emulsion for Thermal Energy Transportation and Storage

Koji FUMOTO, Department of Mechanical Engineering, Kushiro National College of Technology, Japan
Masahiro KAWAJI, Patrick SHALBART, Department of Chemical Engineering and Applied Chemistry, University of Toronto, Canada
Tsuyoshi KAWANAMI, Department of Mechanical Engineering, Graduate School of Engineering, Kobe University, Japan

C2-045 Cooling Characteristics of Refrigerated Vehicle Using Thermal Storage Material

Maulana RIFALDI, Je-Cheol MUN, Kwang-II CHOI, Graduate School, Chonnam National University, Korea
Jong-Taek OH, Department of Refrigeration and Air Conditioning Engineering, Chonnam National University, Korea
Hoo-kyu OH, Department of Refrigeration and Air Conditioning Engineering, Pukyong National University, Korea

C2-122 Flow and Heat Transfer Characteristics of Ice Slurry in Narrow Tubes

Hiroyuki KUMANO, Tetsuo HIRATA, Ryouta SHOUJI, Yousuke HAGIWARA, Department of Mechanical Systems Engineering, Faculty of Engineering, Shinshu University, Japan

D1-009 Development of Commercial Heat Pump Water Heater Using Carbon Dioxide as a Refrigerant


D1-036 The experimental study of commercial air source CO₂ heat pump hot water system

Wang SHOUGuO, Meng TAO, Cao FENG, Xing ZIwen, Xi'an Jiaotong University, China

D1-041 Evaluation of Void Fraction Prediction Methods for Two-Phase Flow Evaporative Pressure Drop of R-744 and R-290 in Horizontal Small Tubes

Kwang-II CHOI, Graduate School, Chonnam National University, Korea
A.S. PAMITRAN, Department of Mechanical Engineering, University of Indonesia, Indonesia
Jong-Taek OH, Department of Refrigeration and Air Conditioning Engineering, Chonnam National University, Korea
Hoo-Kyu OH, Department of Refrigeration and Air Conditioning Engineering, Pukyong National University, Korea

D1-046 Performance Analysis of a CO₂ Heat Pump Water Heating System Under a Daily Change in a Simulated Demand

Ryohei YOKOYAMA, Yasuhiro KOHNO, Tetsuya WAKUI, Department of Mechanical Engineering, Osaka Prefecture University, Japan
Kazuhisa TAKEMURA, Research and Development Department, Kansai Electric Power Co., Inc., Japan
D1-104 A Numerical Study on the Performance of CO₂ Air-conditioning System Using an Ejector
Mo Se KIM, Jae Seung LEE, Min Soo KIM, School of Mechanical and Aerospace Engineering, Seoul National University, Korea

D2: Natural Refrigerant and Lubricant (15:00-16:40)

Chair: Jong Taek OH (Chonnam National University)

D2-110 The performance comparison of two-stage compression CO₂ cycle using internal heat exchangers
Kyungjin BAE, Graduate School of Mechanical Engineering, Chosun University, Korea
Myoungseok KWAK, Byun KANG, Jaehyun BONG, School of Mechanical Engineering, Chosun University, Korea
Honghyun CHO, Department Mechanical Engineering, Chosun University, Korea

D2-127 Effects of Throttle Tube Flow Area on Performance of CO₂ Mobile Air Conditioning System
Yu ZHAO, Zhaogang QI, Jiangping CHEN, Institute of refrigeration and cryogenics, Shanghai Jiao Tong University, China

D2-035 Flow Boiling Heat Transfer Characteristics of CO₂ and CO₂-oil mixtures in a Horizontal Smooth Thin Tube
Lei GAO, Tomohiro HONDA, Department of Mechanical Engineering, Faculty of Engineering, Fukuoka University, Japan
Yoshiihito WATANABE, Madoka SATO, Department of Mechanical Engineering, Graduate School of Engineering, Fukuoka University, Japan

Tuesday, June 8

[Room IBUKA Masaru Memorial Hall]

A3: Absorption and Adsorption Refrigeration 3 (9:20-10:20)

Chair: Atsushi Tsujimori (Kanto Gakuin University)

A3-144 Numerical analysis on adsorption characteristics of activated carbon/ethanol pair in finned tube type adsorber
Naoya MAKIMOTO, Department of Energy and Environmental Engineering, Interdisciplinary Graduate School of Engineering Science, Kyushu University, Japan
Keishi KARIYA, Faculty of Engineering, Kyushu University, Japan
Shigeru KOYAMA, Ken KUWAHARA, Faculty of Engineering Science, Kyushu University, Japan

A3-143 Experimental investigation on a combined double-way thermochemical and adsorption refrigeration system
L. XU, R.Z. WANG, T.X. LI, L.W. WANG, Institute of Refrigeration and Cryogenics, Shanghai Jiao Tong University, China

A3-055 Performance analysis of a low temperature waste heat-driven adsorption desalination prototype plant
Kim Choon NG, Kyaw THU, Hideharu YANAGI, Anutosh CHAKRABORTY, Bidyut B. SAHA, Department of Mechanical Engineering, National University of Singapore, Singapore

A4: Heat Transfer and Heat Exchangers 1 (11:00-12:00)

Chair: Shigeru KOYAMA (Kyushu University)

A4-076 Boiling Heat Transfer Enhancement by Thermal Spray Coating in a Narrow Channel
Hitoshi ASANO, Ryoei TOMITA, Masashi INOUE, Nobuyuki TAKENAKA, Department of Mechanical Engineering, Graduate School of Engineering, Kobe University, Japan
A4-130 A Study of Falling Film Evaporation on Finned Tubes 313
Liang-Han CHIEN, Rong-Hong CHEN, Department of Energy and Refrigerating Air condition, National Taipei University of Technology, Taiwan

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Do-Young KIM, Nae-Hyun KIM, Ho-Won BYUN, Wang-Kyu OH, Ji-Hoon PARK, Department of Mechanical Engineering, University of Incheon, Korea

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Daisuke JIGE, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Japan
Ken KUWAHARA, Shigeru KOYAMA, Faculty of Engineering Sciences, Kyushu University, Japan

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Masafumi KATSUTA, Faculty of Graduate School of Environment and Energy Engineering, Waseda University, Japan
Naoyuki MIYACHI, Takahiro OSHIRO, Youhei OHNO, Graduate School of Environment and Energy Engineering, Waseda University, Japan

A5-091 Theoretical Study on Condensation Heat Transfer for a Horizontal Elliptical Tube in Stationary Saturated Vapor with Wall Suction Effect 344
Tong Bou CHANG, Wen Yu YEH, Department of Mechanical Engineering, Faculty of Engineering, Southern Taiwan University, Taiwan
Fu Jen WANG, Refrigeration, Air Conditioning and Energy Engineering, National Chin-Yi University of Technology, Taiwan

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Zhiyuan WANG, Tao HE, Pengfei LI, College of Vehicle & Power, Henan University of Science and Technology, China
Lining XIAO, Xi'an Jiao Tong University, China

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Bing LI, Shijie YAN, Jiangping CHEN, Institute of Refrigeration & Cryogenics, Shanghai Jiao Tong University, China

Keynote Speech 2(15:45-16:45)
Chair: Masafumi KATSUTA (Waseda University)
Speaker: Nobutoshi MIYOSHI (Minister’s Secretariat Councilor, Ministry of Environment)
“Japanese Action for Climate Change”

B3: Effective Usage and Saving Energy 3 (9:20-10:40)

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Zhiwei WANG, Zhonghe ZANG, Lei SHI, Yi PENG, School of Envir. & Muni. Eng., Xi'an University of Architecture & Technology, China
Wei CAO, Peng LI, Silian Intelligence Technology Share Co., Ltd., China

B3-109 Performance Estimation for the Automotive Air-Conditioning System 375
Chih-Chiu SHEN, Jau-Huai LU, Department of Mechanical Engineering, National Chung Hsing University, Taiwan
Chun-Ta SHIH, Zong-Jhe WU, Automotive Research and Testing Center, Taiwan

B3-062 The Analysis on Influence of Main Factors on Theoretical Value of Energy Saving Rate for Energy Efficiency Labeling of Civil Buildings
Yi PENG, Zhiwei WANG, Zhonghe ZHANG, School of Envr. & Muni. Eng., Xi’an University of Architecture & Technology, China
Wei CAO, Peng LI, Silian Intelligence Technology Share Co., Ltd., China

B4: Effective Usage and Saving Energy 4 (11:00-12:20)

Chair: Chaobin DANG (The University of Tokyo)

B4-074 Performance Study of Thermostatic and Electronic Expansion Valves of a Water-Cooled Scroll Chiller
Jayaprakash SATHTHASIVAM, Kim Choon NG, Department of Mechanical Engineering, National University of Singapore, Singapore

B4-090 Global unsteady state simulation of compression type heat pump with modular analysis - Effect of intermittent driving on system performance -
Keisuke OHNO, Graduate School of Fundamental Science and Engineering, Waseda University, Japan
Kiyoshi SAI TO, School of Fundamental Science and Engineering, Waseda University, Japan

B4-080 Conceptual Design of Two-Stage Air-Conditioner
Dmytro BUYADGIE, Wilson Ltd., Ukraine
Sergii NICHENKO, Vitalyi SECHENYH, Oleksiy BUYADGIE, Igor VA- SIL’EV, Odessa State Academy of Refrigeration, Ukraine

B4-117 Solar Desiccant Air Conditioning System for the Low-Carbon Society
Ayako INOUE, Sunao KAWAI, Faculty of Fundamental Science and Engineering, Waseda University, Japan
Makoto KOGANEI, Department of Perceptual Science and Design Engineering, Faculty of Engineering, Yamaguchi University, Japan
Ken KOMATSU, Takumi NAKAMURA, Nippon Light Metal Co., Ltd., Japan
Tatsuichiro TASHIRO, Shin Nikkei Co., Ltd., Japan
Yasutoshi YOSHIDA, Earthclean-Tohoku Co., Ltd., Japan

B5: Effective Usage and Saving Energy 5 (14:00-15:00)

Chair: Mitsuhiro FUKUTA (Shizuoka University)

B5-128 Annual Performance and Performance Rating of Air Conditioners
Hayato HORIE, Chaobin DANG, Eiji HIHARA, Department of Human and Engineered Environmental Studies, Graduate School of Frontier Sciences, The University of Tokyo, Japan

B5-133 Life Cycle Climate Performance of Air Conditioners
Hayato HORIE, Chaobin Dang, Eiji HIHARA, Department of Human and Engineered Environmental Studies, Graduate School of Frontier Sciences, The University of Tokyo, Japan

B5-139 Experimental research on performance of glazing system, thermal comfort and energy conservation of air-conditioning system in Taiwan
Ruey Lung HWANG, Han Hsi LIANG, Department of Architecture, National United University, Taiwan
Yu Cheng CHANG, Taiwan Society of Heating, Refrigerating and Air-Conditioning Engineers, Taiwan

C3: Application to Foods (9:20-10:20)

Chair: Yasuyuki SAGARA (Food Kansei Communications)
Manabu WATANABE (Tokyo University of Marine Science and Technology)

C3-042 Fundamental research on freezing of refrigerant by making use of membrane
Seiji OKAWA, Department of Mechanical Sciences and Engineering, Tokyo Institute of Technology, Japan
Yuichi TANIGUCHI, Open Sys, Sap Sys of Infra Division, Sec-#1, IBM Global Services Japan Solution and Services Company, Japan

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Sigurjon ARASON, Bjorn MARGEIRSSON, Icelandic Fisheries Laboratory, Iceland

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Naoto HARUKI, Akihiko HORIBE, Kazuma YAMAGATA, Graduate School of Natural Science and Technology, Okayama University, Japan
Hideo INABA, TSUYAMA National College of Technology, Japan

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Chun-Lang YEH, Department of Aeronautical Engineering, National Formosa University, Taiwan

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Koichi HIROSE, Michio KURASHIGE, Department of Mechanical System Engineering, Faculty of Engineering, Iwate University, Japan
Masayuki JIDAISHO, ULVAC Tohoku Inc., Japan
Yuuki ONODERA, Faculty of Engineering, Iwate University, Japan

C4-140 The Effect of Periodic Lid-driven Flow on Suppressing the Double-diffusive Convection during Solidification of a Liquid Binary Alloy 510
Yang-Cheng SHIH, Shu-Min TU, Ming-Hsien LI, Department of Energy and Refrigerating Air-Conditioning Engineering, National Taipei University of Technology, Taiwan

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Yoshio HIRASAWA, Graduate School of Science and Engineering for Research, University of Toyama, Japan

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Mohammad Reza MOBINIPOUYA, Department of Chemistry, Firouzabad Islamic Azad University, Iran
Mohammad Mehdi PAPARI, Department of Chemistry, Shiraz University of Technology, Iran

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Mohammad Reza MOBINIPOUYA, Department of Chemistry, Firouzabad Islamic Azad University, Iran
Mohammad Mehdi PAPARI, Department of Chemistry, Shiraz University of Technology, Iran

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Takashi YOSHIDA, Seiichi YAMAGUCHI, Graduate School of Fundamental Science and Engineering, Waseda University, Japan
Kiyoshi SAITO, Sunao KAWAI, School of Fundamental Science and Engineering, Waseda University, Japan
Naoki ONDA, Solution Technology Dept. Tokyo Gas Co., Ltd., Japan

C5-129 A High Thermal Conductive and Sticky Silicone-based Thermal Pad 543
Chih-Feng HSU, Cheng-Kun LIU, Ming-He CHANG, Wern-Shiang JOU, Institute of Mechanical Engineering, National Taipei University of Technology, Taiwan
D3: Thermophysical Properties of New Refrigerant (9:20-10:40)

Chair: Eiji HIHARA (The University of Tokyo)

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Noboru KAGAWA, Atsushi MATSUGUCHI, Department of Mechanical Systems Engineering, Faculty of Systems Engineering, National Defense Academy, Japan
Koichi WATANABE, Department of System Design Engineering, Faculty of Science and Technology, Keio University, Japan

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Katsuyuki TANAKA, Yukihiro HIGASHI, Department of Mechanical Systems and Design Engineering, Iwaki Meisei University, Japan
Kohei TAKAHASHI, Graduate School of Iwaki Meisei University, Japan
Keizo KOBAYASHI, Research and Development Center, Mayekawa Mfg. Co., Ltd., Japan

D3-085  Effect of Oils on Kinematic Viscosity of R134a 559
Tomoaki SATO, Yoshinori TAKAISHI, Kosei OGUCHI, Department of Mechanical Engineering, Faculty of Engineering, Kanagawa Institute of Technology, Japan

D3-004  Performance Simulation of R22 Alternative Refrigerants in a Finned-Tube Condenser for Low Temperature and Transport Applications
Gang YAN, Yongbin FENG, Wenbo QIAN, Institute of Refrigeration and Cryogenic Engineering, School of Energy and Power Engineering, Xì'ān Jiaotong University, China

D4: Cryogenics and Low Temperature Applications 1 (11:00-12:20)

Chair: Makoto NOHTOMI (Waseda University)

D4-027  Enhancement of the Lineup of the Next Generation Refrigerator “FPSC” and its Applications 580
Toshikatsu NOMIZU, SC Operations, Twinbird Corporation, Japan
Kazuya SONE, SC Development Group, R&D And Production Operations, Twinbird Corporation, Japan

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Mohamed Mehdi BASSEM, Satoshi SHIMOKAWA, Yuki UEDA, Atsushi AKISAWA, Graduate School of Bio-Applications and Systems Engineering, Tokyo University of Agriculture and Technology, Japan

D4-021  Influence of vacuum gauge and baking of adsorption chamber on the residual gases of the HVMLI cryogenic tank
Shujun CHEN, Rongshun WANG, Institute of Refrigeration and Cryogenics, Shanghai Jiao Tong University, China

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Wednesday, June 9

[Room 1]

A6 Heat Transfer and Heat Exchangers 3 (10:00-11:00)

Chair: Bidyut Baran SAHA (Kyushu University)

A6-043  Improvement of Adsorption Heat Exchangers by the Enhancement of Contact Points between Adsorbent and Surface
Masakazu SATO, Graduate School of Bio-Applications and Systems Engineering, Tokyo University of Agriculture and Technology, Japan
Takahiko MIYAZAKI, Yuki UEDA, Atsushi AKISAWA, Institute of Symbiotic Science and Technology, Tokyo University of Agriculture and Technology, Japan
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Akio MIYARA, Department of Mechanical Engineering, Saga University, Japan
Mohammad Ariful ISLAM, Department of Mechanical Engineering, Khulna University of Engineering & Technology, Bangladesh
Rie NAGATOMO, Graduate School of Science and Engineering, Saga University, Japan

A6-116  Heat Exchanger Design of Liquid-Cooled Inverter for Variable Speed Water Chiller  619
Kuo-Shu HUNG, Shih-Chang CHIANG, Hsu-Cheng CHIANG, Bing-Chwen YANG, Kuo-Hsiang CHIEN, Energy and Environment Research Laboratories, Industrial Technology Research Institute, Taiwan


Chair:  Zhang PENG (Shanghai Jiao Tong University)

A7-144  Study on Thermal Performance of Fresh Water Generator System Applied Plate Heat Exchanger  626
YoungHan SHIN, ZhenHua JIN, M. Sq. RAHMAN, S. WIBOWO, HyoungMin LEE, Department of Mechanical and Precision Engineering, Gyeongsang National University, Korea
HanShik CHUNG, HyoMin JEONG, Department of Mechanical and Precision Engineering, Gyeongsang National University, Korea

A7-095  Measure System on Fins Processing Quality of Plate-fin Heat Exchanger  632
Shu JIANGZHOU, Guohui HUANG, Wei LIU, Ding XU, Inst. of Refrigeration, Hangzhou Dianzi University, Xiasha Higher Education Zone, China

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SeongSoo KIM, YongJin SEONG, HyunGweon JEONG, Department of Mechanical and precision Engineering, Gyeongsang National University, Korea
HanShik CHUNG, HyoMin JEONG, Department of Mechanical and precision Engineering, The Institute of marine industry, Gyeongsang National University, Korea

A8: Heat Transfer and Heat Exchangers 5 (13:50-14:50)

Chair:  Akio MIYARA (Saga University)

A8-047  Development of General Correlation for Heat Transfer in Single-Phase Turbulent Flow inside Internally 646 Helically-Grooved Tubes
Norhiro INOUE, Masao GOTO, Department of Electronics and Mechanical Engineering, Tokyo University of Marine Science and Technology, Japan

A8-086  Numerical Study on the Effects of Rib Turbulators in Square Channels  653
Jusik WOO, Seongsoo KIM, Chenkwan PARK, Hyomin JEONG, Department of Mechanical and Precision Engineering, Gyeongsang National University, Korea
HanShik CHUNG, Department of Mechanical and Precision Engineering, Gyeongsang National University, Institute of Marine Science, Korea

A8-099  Study on the numerical modeling of convective heat transfer in turbulent channel flow with semi-circular 659 columns
Gyeonghwan LEE, Juho CHOI, Graduate School, Department of Mechanical and Precision Engineering, Gyeongsang National University, Korea
Taewhee JOUNG, Hyomin JEONG, Hanshik CHUNG, Department of Mechanical and Precision Engineering, Gyeongsang National University, Institute of Marine Science, Korea

[Closing Session(15:00-)]

[Room 2]

B6: Ventilation, Air Distribution and Indoor Air Quality (10:00-11:00)

Chair:  Mitsuo HARADA (Tokyo Electric Power Company)

B6-126  The Effect of Vents Arrangement on the Energy Efficiency of a Convenient Store  664
Yu-Lieh WU, Yean-Der KUAN, Jia-You WANG, Kuang-Cheng YU, Refrigeration, Air-Conditioning and Energy Engineering, National Chin-Yi University of Technology, Taichung, Taiwan

Wen-Der HSIEH, Energy and Environment Research Laboratories, Industrial Technology Research Institute, Taiwan

B6-053 Experimental study of determining neutral temperatures for conventional mixing and stratum ventilation modes in environmental chamber
M.L. FONG, K.F. FONG, Zhang LIN, Building Energy & Environmental Technology Research Unit, Division of Building Science and Technology, College of Science and Technology, City University of Hong Kong, Hong Kong

B6-121 A Low-Cost Method for Testing the Performance of photocatalytic Filter Installed in an Air Cleaner
Hsu-Cheng CHIANG, Hsi-Sheng WU, Jenn-Chyi CHUNG, Yie-Zu HU, Energy and Environment Research Laboratories Industrial Technology Research Institute, Taiwan

B7: Fuel Cell (12:30-13:30)

Chair: Masafumi KATSUTA (Waseda University)

B7-057 A Numerical Study on the Characteristics of Cooling and Water distribution of a passive type PEMFC
Jaehyuk LEE, Bosung KIM, Graduate school of Mechanical Engineering, Korea University, Korea
Yongchan KIM, School of Mechanical Engineering, Korea University, Korea
Yongtaek LEE, Department of Mechanical & Mechatronics Engineering, University of Waterloo, Canada

B7-108 The Efficiency Analysis of DMFCs with Different Hydrophobic Anode Channels
Win-Jet LUO, Jia-You JIANG, Xin-Quan LIN, Yean-Der KUAN, Department of Refrigeration, Air Conditioning and Energy Engineering, National Chin-Yi University of Technology, Taiwan

B7-135 Experimental Investigation on the Cathode Airflow Behavior on the Direct Methanol Fuel Cell Stack
Yean-Der KUAN, Department of Refrigeration, Air Conditioning and Energy Engineering, National Chin-Yi University of Technology, Taiwan
Tzeng-Yuan CHEN, Yu-Chi CHEN, Department of Aerospace Engineering, Tamkang University, Taiwan
Jing-Yi CHANG, Integrated Research Center for Green Living Technologies, National Chin-Yi University of Technology, Taiwan

B8: Front Edge (13:50-14:50)

Chair:

B8-102 CO₂ absorption enhancement in particles/methanol mixture
Jae Won LEE, Jung-Yeul JUNG, Yong Tae KANG, School of Mechanical and Industrial System Engineering, Kyung Hee University, Korea
Jin-Kyeong KIM, Anshik SHIN, Hyojun Lim, Changdae Byun, Coal Chemicals Group, Energy E&C Div., POSCO E&C, Korea

B8-018 Development of New Material Process for Dehalogenation by Sodium Ion Expression Using the Low-Temperature Plasma
Shigeaki INADA, Advanced Science Research Laboratory, Saitama Institute of Technology, Japan

B8-029 Modeling and Simulation of the Operation of a Rotary Magnetic Refrigerator
Didier VUARNOZ, Tsuyoshi KAWANAMI, Department of Mechanical Engineering, Graduate School of Engineering, Kobe University, Japan
Andrei KITANOVSKI, Cyrill GONIN, Peter W. EGOLF, Institute of Thermal Sciences and Engineering IGT, University of Applied Sciences of Western Switzerland, Switzerland

C6: Heat Pump, Chiller and Refrigerator (9:20-11:00)

Chair: Kyoshi SAITO (Waseda University)

C6-114 Temperature-Dependent Thermodynamic Chiller Model in Predicting Variable Speed Centrifugal Chiller Performance
Chung-Che LIU, Jenn-Chyi CHUNG, Hsu-Cheng CHIANG, Jian-Yuan LIN, Energy and Environment Research Laboratories, Industrial Technology Research Institute, Taiwan

C6-005 Theoretical Study and Design of Small-scale Cascade CO2 Sub-critical Mechanical Compression / 748 Ammonia Ejector Refrigerating Unit
V.O.PETRENKO, B.J.HUANG, K.O.SHESTOPALOV, New Energy Center, Department of Mechanical Engineering, National Taiwan University, Taiwan
V.O.IERIN, O.S.VOLOVYK, Odessa State Academy of Refrigeration, Ejector Refrigeration Technology Center, Ukraine

C6-006 Innovative Low-Grade Heat Driven Ejector Chillers and Air Conditioners Operating with Low Boiling Refrigerants
V.O.PETRENKO, New Energy Center, Department of Mechanical Engineering, National Taiwan University, Taiwan, Odessa State Academy of Refrigeration, Ejector Refrigeration Technology Center, Ukraine

C6-072 Development of New Air-Cooled Heat Pump chiller 'Compact Cube' 772
Yasushi OOKOSHI, Takuya ITO, Mitsubishi Electric Corporation, Japan
Hiroshi YAMAGUCHI, Mitsubishi Electric Corporation, Japan
Yohei KATO, Yasutaka Ochiai, Kosuke TANAKA, Mitsubishi Electric Corporation, Japan
Yoshihiro UJI, Kansai Electric Power Co., Inc., Japan
Hiroshi NAKAYAMA, Chubu Electric Power Co., Inc., Japan

C6-015 Design and Performance of a Constant Temperature and Humidity Air-conditioning System Driven by Ground Source Heat Pumps
Xin YU, Ruzhu WANG, Xiaoqiang ZHAI, Institute of Refrigeration & Cryogenics, Shanghai Jiao Tong University, China

C7: System & Element for HVAC&R (12:30-13:30)

Chair: Yoshiharu AMANO (Waseda University)

C7-039 Performance Characteristics of Bubble pump with Riser height of Separator 786
Kwangsung LEE, Jusik WOO, Supriyanto WIBOWO, Graduate School, Department of Mechanical and Precision Engineering Department, Korea
Hyomin JEONG, Hanshik CHUNG, Department of Mechanical and Precision Engineering, the Institute of Marine Industry, Gyeongsang National University, Korea

C7-093 Experiment Study on Fresh Water Generation System Utilizing Vacuum Evaporation 792
Supriyanto WIBOWO, Kwangsung LEE, Doosang HEO, Graduate School, Department of Energy and Mechanical Engineering, Gyeongsang National University, Korea
HyoMin JEONG, Hanshih CHUNG, Department of Energy and Mechanical Engineering, The Institute of Marine Industry, Gyeongsang National University, Korea

C7-008 An Experimental Study on an Induction Enhanced Flow Cooling Tower 797
Yew Khoy CHUAH, Hong-Jun ZHENG, Department of Energy and Refrigerating Air-Conditioning Engineering, National Taipei University of Technology, Taiwan

C8: Cycle Control (13:50-14:50)

Chair: Yoshiharu AMANO (Waseda University)

C8-034 Design of Steady State Detector for Fault Detection and Diagnosis of CO2 Heat Pump Water Heater with 804 Decomposition Analysis Technique
Chul Woo ROH, Jae Seung LEE, Min Soo KIM, School of Mechanical and Aerospace Engineering, Seoul National University, Korea
Minsung KIM, Solar Thermal and Geothermal Research Center, Korea Institute of Energy Research, Korea

C8-120 Wireless sensor network applied to thermal comfort of convenient stores customers and monitor the air-conditioning power consumption
Chih-Sheng CHEN, Liang-Cheng CHANG, Graduate Institute of Mechanical & Electrical Engineering, National Taipei University of Technology, Taiwan
Da-Sheng LEE, Department of Energy and Refrigerating Air-conditioning Engineering, National Taipei University of Technology, Taiwan
The Direct Neural Control Applied to Energy-saving Air Conditioner Systems

Chien-Hsin HSIEH, Zhi-Wei CHEN, Der-Ming CHYR, Ming-Huei CHU, Department of Mechatronic Technology, College of Engineering, The Tunghnan University, Taiwan