

10th IIR Conference on Phase Change Materials and Slurries for Refrigeration and Air Conditioning 2012

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7/29/2012

16:00-20:00 Registration

18:00-20:00 Welcome party

7/30/2012

Opening session

9:20-10:00 Welcome speech

A-1 Welcome Address

D Coulomb (*International Institute of Refrigeration*)

10:00-10:40 Chair: H Suzuki

K-1 Estimating Basic Properties of Ice Slurries

Å Melinder (*KTH Royal Institute of Technology, Sweden*)

10:40-11:00 ===== Break =====

Session 1: Encapsulation and composite of PCM materials

11:00-12:00 Chair: M Ostry

O-11 Thermal performance of granular PCM and development of salt hydrate eutectics for air conditioning

S Pinnau, M Mischke, C Bretkopf, A Efimova, M Ruck and P Schmidt (*Technische Universität Dresden, Germany; Lausitz University of Applied Sciences, Germany*)

O-13 Thermal characteristics of nitrates and nitrates/expanded graphite composite as phase change materials for solar energy storage

X Xiao and P Zhang (*Shanghai Jiao Tong University, China*)

O-14 Preparation and characteristics of Paraffin / nano-alumina composites as thermal energy storage materials

X Zhang, W Wang, Z Li, X Li, Z Han, Y Yang, X Liu and Y Wu (*Shanghai Maritime University, China*)

12:00-13:20 ===== Lunch =====

Session 2: Thermal and rheological properties of PCM materials and slurries

13:20-15:00 Chair: D W Lee and K Fujioka

- O-21 Development of PCM Containing CNT for heat storage application** (%
D H Choi, Y J Kim and Y T Kang (*Kyung Hee University, Korea; LG Electronics, Korea*)
- O-22 Viscosity characteristics of slurries containing Tetra-n-butyl Ammonium salt semi-clathrate hydrate crystal and solution** (,
S Hashimoto and K. Kawamura (*Osaka University, Japan*)
- O-23 Determining the rheological behavior of octadecane as phase change material: First approach** () *
M Delgado, A Lázaro, C Peñalosa, M B Zalba (*University of Zaragoza, Spain; Aragón Institute of Engineering Research, Spain*)
- O-24 Solidification heat transfer characteristics of ammonia alum hydrate slurries treated with drag-reducing surfactants** (** (
H Suzuki, M Fujii, T Fudaba, Y Komoda, T Ishigami and R Hidema (*Kobe University, Japan*)
- O-25 Molecular Dynamics Simulation of Thermal Transport in Silicon-Octane System** (** + &
Y Wang and Z Chen (*Southeast University, China*)

15:00-15:20 ===== Break =====

Session 3: Crystallization process of ice and PCM materials

15:20-17:00 Chair: Y T Kang and S Okawa

- O-31 Generation of TBAB clathrate hydrate slurry (CHS) by accession of CHS into supercooled aqueous solution** (** + ,
X J Shi and P Zhang (*Shanghai Jiao Tong University, China*)
- O-32 Investigation on possibility of controlling ice adhesion force to solid surface by using thin film made from silane-coupler** (**) , *
H Inaba, K Maruhashi, K Matsumoto, M Morohoshi (*Hitachi Solutions, Japan; Chuo University, Japan; Mitsubishi Heavy Industries, Japan*)
- O-33 Molecular dynamics simulations and dissipative particle dynamics study of phase change materials** (**) &
Z Rao and S Wang (*South China University of Technology, China*)
- O-34 A new defrosting method for utilization of frost** (**) % \$ \$
S Inoue, H Ohkubo, S Ikemoto (*Tamagawa University, Japan*)
- O-35 Crystal growth of mussy layer in ethanol-water mixture** (**) % \$,
K Kuwahara, J Ochiai, R Itoh and H Ohkubo (*Offiice Kuwahara, Japan; Tamagawa University, Japan*)

7/31/2012

Session 4: Fluid flow and heat transfer of ice and PCM slurries

9:20-12:20 Chair: A Sowono, H Asano and K Fumoto

O-41 Flow and heat transfer characteristics of ice slurries in a helically coiled pipe

N Haruki, A Horibe and M Mouri (*Okayama University, Japan*)

O-42 Study on stratification mechanism and its variation regularity of ice slurry flow in horizontal pipe

Q Tian, G He, H Wang and D Cai (*Huazhong University of Science and Technology, China*)

O-43 Heat transfer and flow behavior of ice slurry around heated object

K Togashi, T Kawanami, K Fumoto and S Hirasawa (*Kobe University, Japan; Hirosaki University, Japan*)

O-44 Study on flow and heat transfer characteristics in transition region for ice slurry

S Sawada, F, Tamura and H Kumano (*Shinshu University, Japan; Aoyama Gakuin University, Japan*)

10:40-11:00 ===== Break =====

O-45 Flow behavior and heat transfer of CO₂-TBPB hydrate slurry in a refrigeration system

P Clain, A Delahaye and L Fournaison (*Irstea, France*)

O-46 Heat transfer and fluid flow behavior of an economical microencapsulated phase change material slurry in turbulent flow

J L Alvarado, H Taherian, E M Languri and C Thies (*Texas A&M University, USA; University of Alabama at Birmingham, USA; Thies Technology, USA*)

O-47 Study on emulsion including phase change nanoparticles as a heat storage material

K Fumoto, N Sato, T Okamura, M Kawaji, T Kawanami and T Inamura (*Hirosaki University, Japan; Hirosaki University, Japan; Denso, Japan; CCNY, USA; Kobe University, Japan*)

O-48 Temperature, flow velocity and protein concentration near ice surfaces in mini-channels

Y Onishi, Y Nakagawa, A Kitagawa and Y Hagiwara (*Kyoto Institute of Technology, Japan*)

12:20-13:20 ===== Lunch =====

Technical & Industrial Poster sessions

13:20-15:20

- P-1 Measurement of thermal conductivity of TBAB CHS by inclusion of the effect of phase change**
P Zhang and Z W Ma (*Shanghai Jiao Tong University, China*)
- P-2 Study on Effective Thermal Conductivity of Form-stable Phase Change Material by Fractal-Cavity Theory**
X Dai and Z Chen (*Southeast University, China*)
- P-3 Adsorption characteristics of ammonia alum hydrate particles onto the coated metal**,
T Toyoda, H Suzuki, Y Komoda and R Hidema (*Kobe University, Japan*)
- P-4 Numerical simulation of supercooled water flow with an ice crystal in a two dimensional duct**
T Tsurugasaki, K Tatsuta, Y Hagiwara and T Takaki (*Kyoto Institute of Technology, Japan; Daiken Iki, Japan*)
- P-5 Heat transfer performance improvement of stearic acid solution by adding CNT for heat storage application**
J H Lee, Y J Kim and Y T Kang (*Kyung Hee University, Korea; LG Electronics, Korea*)
- P-7 Latent Heat transportation system using direct-contact heat exchanger**
T Nomura, M Tsubota, N Okinaka and T Akiyama (*Hokkaido University, Japan*)
- P-8 Battery thermomanagement in electric vehicles using phase change slurries**
C Taetz, L G Hanu, T Kappels and C Pollerberg (*University of Bochum, Germany; UMSICHT, Germany*)
- P-9 Experimental assessment of PCMs integrated in light-weight structures**
D Beckovsky, M Ostry and T Klubal (*Brno University of Technology, Czech Republic*)
- PI-1 Daikin Industries, Ltd.**
- PI-2 Functional Fluids Ltd.**
- PI-3 JSR Corporation**
- PI-4 Mayekawa Mfg. Co., Ltd.**
- PI-5 Osaka Gas Co.,Ltd.**
- PI-6 Takasago Thermal Engineering Co., Ltd.**

Session5: PCM applications in Asian countries

15:20-16:00 Chair: A Horibe

K-2 Recent progresses of R&D and applications of PCMs and slurries in China

P Zhang (*Shanghai Jiao Tong University, China*)

16:00-16:40 Chair: H Ohkubo

K-3 Current status of thermal energy storage in Korea

D W Lee (*Korea Institute of Energy Research, Korea*)

16:40-17:20 Chair: L Fournaison

K-4 Recent advances in thermal energy storage and transport systems using phase change materials in Japan

T Inada (*National Institute of Advanced Industrial Science and Technology, Japan*)

Social events

19:20-21:30 ===== Dinner cruise banquet =====

8/1/2012

Session 6: Evaluation of ice and PCM slurry systems

9:20-10:00 Chair: Y Hagiwara

- K-5 Application of phase change material additive to secondary refrigerant for energy saving in air conditioning system**
A Suwono (*Bandung Institute of Technology, Indonesia*)

10:00-10:20 ===== Break =====

10:20-12:20 Chair: P Zhang and H Kumano

- O-61 PCM-based thermal storage for solar air heating systems**,
P Charvat and M Ostry (*Brno University of Technology, Czech Republic*)
- O-62 Evaluation of the thermal energy balance of a practical cow barn with dynamic type ice storage** (
S Hirano, H Hoshina, K Yanagida and T Kawanami (*Hokkaido Research Organization, Japan; Yanagida Electronic, Japan; Kobe University, Japan*)
- O-63 Direct-contact heat-transfer characteristics in a latent heat storage vessel: effect of perforated partition plate** %
A Horibe, H Jang, N Haruki and K Habara (*Okayama University, Japan*)
- O-65 Calculating tool of energy and financial savings thanks to cold storage** -
G Duhot (*EDF, France*)
- O-66 Comparison of exergy analysis between Hvac systems with MPCs and Ice storage** \$+
J Zhao (*Donghua University, China*)

12:20-13:20 ===== Lunch =====

Session 7: CO₂ slurries for refrigeration system

13:20-14:20 Chair: G He

- O-71 Study on stability of CO₂ hydrate slurries used as secondary refrigerants** %
N Liu, W Chen and H Dai (*University of Shanghai for Science and Technology, China*)
- O-72 Experimental studies of the heat density of paraffin and gas hydrate slurry for cold production and refrigeration applications** &\$
Z Youssef, A Delahaye, L Fournaison and C Zambrana (*Irstea, France*)
- O-73 CO₂ hydrate growth model and its experimental validation** &+
C Vasilescu and C I Ferreira (*Delft University of Technology, the Netherlands*)

Session 8: Various production processes of ice crystals and slurries

14:20-15:20 Chair: Å Melinder

O-81 Development of a 350 RT- horizontal screw type Ice Slurry maker coupled by a turbo compressor (Y P Lee, H M Lim and S H Lee (*Korea Institute of Science and Technology, Korea*)

O-82 Investigation into the supercooler coated with nano-fluorocarbon film in the dynamic ice-making system (& H Wang, G He, Q Tian and D Cai (*Huazhong University of Science and Technology, China*)

O-83 Research on the characteristic of vacuum binary ice preparation driven by solution absorb (- X Zhang, X Li, Z Li, W Wang, X Liu, Y Wu, Z Han and Y Yang (*Shanghai Maritime University, China*)

15:20-15:40 ===== Break =====

Session 9: Various applications of PCM materials

15:40-16:40 Chair: T Inada

O-91 High purity Paraffins from renewable resources for PCM () * S Hoppe (*Sasol Germany, Germany*)

O-93 Research on freezing of refrigerant package with a small degree of supercooling * (S Okawa (*Tokyo Institute of Technology, Japan*)

O-94 Comparison of selected PCMs for building applications +\$ M Ostry, P Charvat and R Prikryl (*Brno University of Technology, Czech Republic*)

Closing session

16:40-17:00 Closing speech

8/2/2012

Post Conference Technical Tour

JFE Engineering, Yokohama

- 8:00 Meet at Shin-Kobe Station, and move to Shin-Yokohama (Super express)
- 12:00-13:00 Lunch @ JFE Engineering
- 13:00-15:00 Technical visit (TBAB Slurry Cooling System)
- 15:00 This tour will be finished at JFE Engineering