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The 22nd SCEJ Symposium on Fluidization & Particle Processing

Institute of Industrial Science, The University of Tokyo
Program

Dec. 8 (Thu) Day 1 Room A (Convention Hall, Building An, 2nd floor)

8:15	– 9:00	Registration
9:00	– 9:15	Opening Remarks Executive Committee Chairman M. Sakai (UTokyo)
Plenary Lecture		Chair: M. Sakai (UTokyo)
9:15	– 9:55	Coupling of coarse-grained discrete particle method and particle-in-cell method for gas-solid flow simulation F. Chen, L. Lu, W. Ge, J. Li (CAS)
9:55	– 10:05	Break
Session A-1 Dispersion Engineering		Chair: T. Ishigami (Nihon Univ.)
10:05	– 10:22	Effect of the position to apply pressure oscillation for bubbles at the continuous flow channel A. Mizukoshi[1], S. Iwata[1], H. Mori[1], R. Nagumo[1], T. Takahashi[2], T. Onuma[3] ([1]Nagoya Inst. Technol., [2]Nagaoka Univ. Technol., [3]Photron Limited)
10:22	– 10:39	Effect of impeller shape on particle aggregation in a stirred tank H. Masuda[1], K. Tsuda[2], K. Matsui[2], T. Horie[2], Y. Komoda[2], N. Ohmura[2] ([1]Univ. Shizuoka, [2]Kobe Univ.)
10:39	– 10:56	Motion of a Droplet in Liquid-Liquid Systems S. Homma, T. Yoshikawa, T. Sato (Saitama Univ.)
10:56	– 11:10	Break
		Chair: S. Fujioka (Keio Univ.)
11:10	– 11:27	Effect of Interfacial Properties on Rheology in Capillary Suspension T. Ishigami, K. Nakamura, H. Sato, M. Imai (Nihon Univ.)
11:27	– 11:57	**<Keynote Lecture>** Applications of fine bubble technology for wall cleaning K. Terasaka (Keio Univ.)
11:57	– 13:00	Break
Plenary Lecture		Chair: S. Honma (Saitama Univ.)
13:00	– 13:40	Moving Particle Semi-implicit method for fluid flow analysis with free surfaces S. Koshizuka (UTokyo)
13:40	– 13:50	Break
Session A-2 Fluidization/Chemical Reaction Process I		Chair : T. Kai (Kagoshima Univ.)
13:50	– 14:07	Integrated Energy Recuperative Biomass Gasification and SOFC System for Hydrogen and Power Coproduction A. Tsutsumi[1], D. Panthi[1], M. Ishizuka[1], K. Tsutsumi[2], T. Ishizuka[3] ([1]UTokyo, [2] Energy Power Systems, Inc., [3] Hokkaido Electric Power Co., Inc.)
14:07	– 14:24	Attrition characteristics of oxygen carrier particles for chemical-looping combustion T. Hatanaka, Y. Yoda, A. Matsumura (AIST)
14:24	– 14:41	A Study of Fluid Forces on Heat Transfer Tubes in a Bubbling Fluidized Bed by CFD Simulation Y. Yamane, Y. Iso (IHI)

14:41	–	14:58	CFB Application for Power Plant of Wood Oriented Biomass Fuels T. Utsumi (JFE Engineering Corporation)
14:58	–	15:10	Break
			Chair : H. Kamiya (TUAT)
15:10	–	15:27	Model of non-equimolar counter diffusion as the cause of defluidization after gas switching T. Kai (Kagoshima Univ.)
15:27	–	15:44	Solid mass flow rate control in circulating fluidized bed by a pulsed riser gas flow M. Ishizuka, Y. Kansha, A. Tsutsumi (UTokyo)
15:44	–	16:01	Production of Egg White Powder by Drip Drying in a Spouted Bed T. Nakazato, N. Hamahata, T. Kai (Kagoshima Univ.)
16:01	–	16:18	Classification of Naturally Occurring Fluidization Phenomena M. Horio (Horio Office, TUAT)
16:18	–	16:30	Break
Poster Session			
16:30	–	18:00	Foyer (Building An, 2nd floor) Chair : M. Sakai (UTokyo), S. Fujioka (Keio Univ.)

Banquet			
18:30	–	20:30	Banquet (Building An, 1st floor, Restaurant ape)

Dec. 8 (Thu) Day 1 Room B (Main conference room, Building An, 3rd floor)

Session B-1 Particle Processing			
			Chair : M. Iijima (Yokohama National Univ.)
10:05	–	10:35	**<Keynote Lecture>** Formation of nano and micro silicon materials from gas phase reaction: Control of their size and morphologies S. Inasawa (TUAT)
10:35		10:52	Effects of water-soluble ions derived from solid particles on the dispersion of bi-dispersed colloidal system H. Tanaka[1], M. Ishida[1], M. Sakai[2] ([1]TDK, [2]UTokyo)
10:52	–	11:05	Break
			Chair : T. Mori (Hosei Univ.)
11:05	–	11:22	Microstructures of the green body prepared from a slurry of Si composited with sintering aids and their effects on Si3N4 ceramic fabrication process using post-reaction sintering technique S. Morita, M. Iijima, J. Tatami (Yokohama Nat. Univ.)
11:22	–	11:39	Hydrothermal Growth of High-Quality Yttria-Stabilized Zirconia Nanocrystals from Basic Carbonate Complex Precursor K. Sato[1], K. Horiguchi[1], N. Pouy[1], H. Abe[2] ([1]Gunma Univ., [2]Osaka Univ.)
11:39	–	11:56	Manufacture of Pressure Responsive Particle by Using Polymer having Pressure Dependencies of Solubility on Side Chain H. Satone, K. Iimura, M. Suzuki (Univ. Hyogo)
11:56	–	13:50	Break
Session B-2 Numerical Modeling			
			Chair: H. Ikari (Kyoto Univ.)
13:50	–	14:07	Development of wall boundary representation for the stirred vessel analysis with MPS method T. Matsunaga, S. Koshizuka (UTokyo)
14:07	–	14:24	Improvement on the simulation efficiency of particle methods by the ellipsoidal particle model and the overlapping particle technique K. Shibata[1], S. Koshizuka[1], I. Masaie[2] ([1]UTokyo, [2]Prometech Software Inc.)

14:24	–	14:41	Development of a multi-physics particle method code for the simulation of severe accidents in nuclear power plants K. Inagaki (CRIEPI)
14:41	–	14:55	Break
			Chair : K. Shibata (UTokyo)
14:55	–	15:12	An applicability of a particle method with elastic-plastic constitutive model for large deformation analysis of granular structure H. Ikari, H. Gotoh (Kyoto Univ.)
15:12	–	15:29	Large-scale Simulations for Fluidization Using Direct Calculation of Fluid-solid Interactions S. Watanabe, T. Aoki, Y. Hasegawa (Tokyo Inst. Technol.)
15:29	–	15:46	Numerical analysis of a rolling ball on high-viscous fluid by DEM-MPS K. Sakakura[1], H. Takeda[2] ([1]Idemitsu Kosan Co., Ltd., [2]R-FLOW Co., Ltd.)
15:46	–	16:03	Reaction-Heat Transfer Simulation on CaSO4 Chemical Heat Storage Y. Motohashi[1], Y. Aman[1], Y. Shiren[1], K. Hayakawa[1], N. Kobayashi[2] ([1]RICOH, [2]Nagoya Univ.)

Dec. 9 (Fri) Day 2 Room A (Convention Hall, Building An, 2nd floor)

Plenary Lecture			Chair: S. Watano (Osaka Pref. Univ.)
9:00	–	9:40	Analysis of the Active Drying Zone Within a Wurster Coater - CFD/DEM Simulation of Fluid Beds Including Heat and Mass Transfer D. Jajcevic[1], P. Böhling[1], J. Khinast[2] ([1]RCPE, [2] Graz Univ. Technol.)
9:40	–	9:50	Break
Session A-3 Fluidization/Chemical Reaction Process Ⅱ			
			Chair : C. Fushimi (TUAT)
9:50	–	10:07	Mixing and Segregation of Coarse Flotsam in Gas-Solid Fluidized Beds H. Hatano, K. Fujino (Chuo Univ.)
10:07	–	10:24	Agglomeration Behavior by Heat of Oxidation from Lattice Oxygen Carriers in Fluidized Beds K. Fujino, K. Kanaizuka, H. Hatano (Chuo Univ.)
10:24	–	10:41	Effect of vertical bed vibration on particle velocity in a gas-solid fluidized bed Y. Mawatari, W. Kamata, M. Tateishi, M. Yamamura, H. Kage (Kyushu Inst. Technol.)
10:41	–	10:55	Break
			Chair : Y. Mawatari (Kyushu Inst. Technol.)
10:55	–	11:12	Interaction between cylinder and single bubble in 2-D fluidized bed D. Yoshioka[1], T. Tsuji[1], K. Washino[1], T. Tanaka[1], H. Takeuchi[2], Y. Nagahashi[2] ([1]Osaka Univ., [2] Kochi National College of Technology)
11:12	–	11:29	Analysis of drag in granular materials using large-scale DEM simulation (Study of particle volume fraction dependence) M. Kobayakawa, S. Miyai, T. Tsuji, T. Tanaka (Osaka Univ.)
11:29	–	11:46	Development of the FCA (Fluid Catalytic Aromaforming) process H. Tsuneoka[1], R. Ida[1], Y. Iwasa[1], S. Takano[2] ([1] JX Nippon Oil & Energy Corporation, [2] Chiyoda Corporation)
11:46	–	13:00	Break
Symposium Award Lecture			Chair: K. Kuwagi (Okayama Univ. Sci.)
13:00	–	13:20	Development of the FCA (Fluid Catalytic Aromaforming) process Y. Iwasa[1], S. Yanagawa[1], O. Hirohata[2] ([1] JX Nippon Oil & Energy Corporation, [2] Chiyoda Corporation)
13:20	–	13:35	Break
Session A-4 Bioengineering and Pharmaceutical			
			Chair : H. Sugiyama (UTokyo)
13:35	–	14:05	**<Keynote Lecture>** Microfluidic Approach for Particle/Cell Separation Technique M. Seki (Chiba Univ.)

14:05	–	14:22	Enzymatic cascade reactions using colloidal interface and aqueous phase of liposomes M. Yoshimoto[1], T. Ohtsu[1], S. Shigenari[2] (Yamaguchi Univ.)
14:22	–	14:30	Break
			Chair : M. Yamada (Chiba Univ.)
14:30	–	14:47	Formulation of monodisperse O/W emulsions loaded with quercetin using microchannel emulsification and their stability evaluation N. Khalid[1,2], I. Kobayashi[1], M.A. Neve[1,3], K. Uemura [1], M. Nakajima[1,3], H. Nabetani[1,2] ([1] Food Research Institute, NARO, [2] Univ. Tsukuba, [3] UTokyo)
14:47	–	15:04	Process Systems Engineering for Pharmaceutical Manufacturing H. Sugiyama (UTokyo)
15:04	–	15:21	Analysis of segregation mechanism in a hopper by DEM simulation K. Shibuki[1], J. Wakuda[1], M. Sakai[2] ([1]AJINOMOTO Co., Inc., [2]UTokyo)
15:21	–	15:30	Break
Session A-5 Fluidization/Chemical Reaction Process Ⅲ			
			Chair : T. Tsuji (Osaka Univ.)
15:30	–	15:47	Analysis of one particle of movement in vibro-fluidized bed using PEPT A. Kogane[1], K. Kuwagi[1], T. Kinugasa[1], Y. Mawatari[2] ([1]Okayama Univ. of Science, [2]Kyushu Inst. Technol.)
15:47	–	16:04	3D Imaging of Sand Particle Movement under Rotating Wheel via PEPT - Repeatability and Comparison to 2D imaging - T. Kinugasa, K. Kuwagi, H. Kawamoto, Y. Ueda, K. Yoshida, R. Hayashi (Okayama Univ. Sci.)
16:04	–	16:20	Break
16:20	–	16:50	Awards Ceremony
16:50	–	17:00	Closing Remarks Executive Committee Chairman of The 22nd SCEJ Symposium on Fluidization & Particle Processing Y. Tatemoto (Shizuoka Univ.)

Dec. 9 (Fri) Day 2 Room B (Main conference room, Building An, 3rd floor)

Session B-3 Multiphase Flow			
			Chair : N. Shimada (Sumitomo chemical Co. Ltd.)
9:50	–	10:20	**<Keynote Lecture>** Numerical Simulation and Modeling of Motion of Bubbles and Drops K. Hayashi (Kobe Univ.)
10:20	–	10:37	Numerical analysis of particle-particle adhesion in wet granulation H. Kan, H. Nakamura, S. Watano (Osaka Prefecture Univ.)
10:37	–	10:54	Numerical simulation methods comparison for fluidized bed analysis K. Murozono, O. Baran (CD-adapco Co., Ltd. (Siemens PLM Software))
10:54	–	11:10	Break
			Chair : M. Yoshimoto (Yamaguchi Univ.)
11:10	–	11:27	A study by visualization of particle concentration under electric field using micro X-ray CT W. Kubota[1], S. Iwata[1], M. Kamitani[2], M. Fuji[1] ([1]Nagoya Inst. Technol., [2]Makino Corp)
11:27	–	11:44	A study for improvement of an interface tracking and an averaging model N. Shimada, S. Senda, Y. Uchihashi (Sumitomo chemical Co. Ltd.)
11:44	–	13:50	Break
Session B-4 Energy			
			Chair : H. Watanabe (Kyushu Univ.)
13:35	–	13:52	Investigation of the influence of noble metals on rheology of high-level nuclear waste glass K. Uruga, T. Usami, T. Tsukada (CRIEPI)

13:52	-	14:09	Numerical and Bench Scale Test Studies on chemically reacting flow inlcuded in partial oxidation of coke oven gas K. Norinaga, S. Kudo, J. Hayashi, H. Watanabe (Kyushu Univ.)
14:09	-	14:26	Mechanochemical Polymerization of the Vinyl Monomer by Planetary Mill M. Kimata, T. Chigira (Yamagata Univ.)
14:26	-	14:40	Break
			Chair : K. Norinaga (Kyushu Univ.)
14:40	-	14:57	Redox Performance of Lattice Oxygen Carriers for Chemical Looping Combustion K. Fujino, K. Kanaizuka, H. Hatano (Chuo Univ.)
14:57	-	15:14	Numerical simulation of ignition process of a pulverized coal particle H. Watanabe, W. Zhang, T. Kitagawa1 (Kyushu Univ.)
15:14	-	15:44	**<Keynote Lecture>** Smoothed particle hydrodynamics and its application in mineral processing J. Kwon, H. Cho (Seoul Nat. Univ.)

Dec. 8 (Thu) Day 1 16:30-18:00 Foyer (Building An, 2nd floor)

Poster Session

1	Heat transfer under fluidized bed drying conditions N. Ogawa[1], T. Shimizu[2], H. Kim[2], L. Li[2] (Niigata Univ.)
2	Influence of back pressure on particle circulation by a loop seal T. Uehara, R. Noda (Gunma Univ.)
3	Development of CNT-coated particle for fluidized catalytic NH3 decomposition K. Wanibuchi, R. Noda (Gunma Univ.)
4	Measurement of the constant-drying rate of wet material immersed in fluidized bed under reduced pressure R. Ogawa, Y. Tatemoto (Shizuoka Univ.)
5	Numerical analysis of drying characteristics of wet material in fluidized bed of hygroscopic porous particles A. Koido, Y. Tatemoto (Shizuoka Univ.)
6	Up-grade of brown-coals and biomass in artificial sunlight heated fluidized bed K. Kondo, Y. Mizuno, L. Li, T. Simizu, H. Kim (Niigata Univ.)
7	NOx formation and reduction during coal combustion in regenerator under Ca-Looping process conditions T. Shimoda, T. Shimizu, H. Kim, L. Li (Niigata Univ.)
8	Experimental investigation on gas-solid behavior in the fluidized-bed with superfine particles K. Shimasaki, T. Goshima, K. Mizuta, T. Tsutsui, S. Nii (Kagoshima Univ.)
9	Analysis of consecutive reaction model considering direct contact in bubbling fluidized bed reactor with Gerdart' s A particles K. Nakazato, T. Goshima, K. Mizuta, T. Tsutsui, S. Nii (Kagoshima Univ.)
10	Effects of the properties of gas and particles on defluidization due to switching of fluidizing gas K. Terachi, T. Kai, T. Nakazato (Kagoshima Univ.)
11	Study on the particle reforming using a fluidized bed plasma reactor K. Hanai, N. Kobayashi, Y. Itaya (Gifu Univ.)
12	Detailed Chemical Kinetic Modeling of Primary Pyrolysis of Lignin Y. Furutani, Y. Dohara, S. Kudo, J. Hayashi, K. Norinaga (Kyushu Univ.)
13	Rate of CaCO3 decomposition under the Calcium-Looping process conditions H. Tukahara, T. Shimizu, H. Kim, L. Li (Niigata Univ.)
14	Bubble behavior in a fluidized catalyst bed accompanied by gas volume expansion H. Miyata, T. Kai, T. Nakazato (Kagoshima Univ.)
15	Influence of preparation method of methanol synthesis catalysts on the reaction activity S. Iguchi[1], R. Noda[1], Adiarso[2], P. Joni[2], D. Bralin[2], H. Septina[2], P. Tyas[2], S. Atti[2], A. Juwita[2], F. Yanti[2], N. Valentino[2] ([1]Gunma Univ., [2]BPPT Indonesia)
16	Development of composite process of solid electrolyte-active material-conductive additives for all-solid-state battery T. Ozaki, H. Nakamura, S. Watano (Osaka Prefecture Univ.)
17	Process Systems Approaches for Pharmaceutical Tablet Manufacturing Considering Batch and Continuous Technologies K. Matsunami[1], T. Miyano[2], H. Arai[2], H. Nakagawa[2], M. Hirao[1], H. Sugiyama[1] ([1]UTokyo, [2]Daiichi Sankyo Co., Ltd.)
18	Composite of solid electrolyte and electrode particles for all-solid-state battery T. Masuyama, H. Nakamura, T. Kawaguchi, S. Watano (Osaka Prefecture Univ.)
19	Investigation of reactivity of coal in a downer pyrolyzer with heat carrying particles and steam M. Kobayashi[1], M. Koyama[1], S. Thangavel[1], C. Fushimi[1], K. Matsuoka[2] ([1]TUAT, [2]AIST)
20	Study of the fluidized catalyst bed reactor model utilizing a hydrogenation reaction of carbon dioxide K. Daian, T. Kai, T. Nakazato (Kagoshima Univ.)
21	Analysis of the fluidized catalyst bed reactor by using CO2 chemical absorption T. Sakaguchi, T. Kai, T. Nakazato (Kagoshima Univ.)

22	Energy-saving Drying of Brown Coal・Biomass by Double-column Self-heat Recuperative Process L. Chen, Y. Kansha, M. Ishizuka, A. Tsutsumi (UTokyo)
23	Microfluidic formation of functional core-shell particles using silicone rubber and polyimide. M. Shimanuki[1], Y. Komazaki[1], T. Torii[1], K. Sawada[2], N. Sugihara[2], K. Ishikura[2], S. Karashima[2] ([1]UTokyo, [2]Sumitomo Seika Chemicals Company Limited)
24	Numerical analysis of the dynamics of an immiscible drop impact on a quiescent fluid layer T. Morishita, M. Ohta (Tokushima Univ.)
25	Numerical analysis of shear-induced deformation and break-up of a drop in shear-thinning liquids Y. Suetsugu, M. Ohta (Tokushima Univ.)
26	A model for predicting pressure drop of liquid-liquid slug flow in milli-channels S. Sano, S. Fujioka, K. Terasaka (Keio Univ.)
27	Effect of Particle Dispersion State on Properties of Sprayed Coating for Suspension Spraying N. Iwata, T. Mori (Hosei Univ.)
28	Effect of Dispersion of Catalyst Particles and Ionomer on PEFC Peformance S. Moriyama[1], T. Mori[1], M. Kishi[1,2] ([1]Hosei Univ., [2]Nissan Motor Corporation, Limited)
29	Effects of trace amounts of additives on the aging of the slurry properties R. Kitagawa, T. Tatemura, T. Mori (Hosei Univ.)
30	Experimental evaluation for the validity of the similarity rule of bubbling fluidized bed based on the model of pressure fluctuations and bubble behaviors Y. Takai, H. Ishii (National Institute of Technology, Tokyo College)
31	Medium-exchange microfluidic device for continuous and multistep chemical treatment of microparticles H. Toyoda, M. Yamada, M. Seki (Chiba Univ.)
32	Development of size-dependent particle separation process using dual-depth microfluidic lattice channel T. Yanai, M. Yamada, W. Seko, M. Seki (Chiba Univ.)
33	Fabrication of Protein Particles Using Solvent Drying Process and Its Application Y. Yajima, A. Hori, M. Yamada, S. Sugaya, R. Utoh, M. Seki (Chiba Univ.)
34	A numerical study on focusing dynamics of particles flowing in microchannels H. Udono, M. Sakai (UTokyo)
35	Biopharmaceutical process optimization: needs and benefits of numerical simulation approaches G. Casola[1], C. Siegmund[2], M. Mattern[2], H. Sugiyama[1] ([1]UTokyo, [2]F. Hoffmann-La Roche Ltd)
36	Multicompartment Giant Vesicles Fabrication by Lipid-Coated Ice Droplet Hydration Method for the Construction of Cell-Mimicking Enzyme Reaction System E. Hashimoto, K. Ozono, Y. Nishita, S. Ichikawa (Univ. Tsukuba)
37	Transdermal cancer vaccine utilizing solid-in-oil nano dispersion technology for antigen protein H. Kouno, R. Wakabayashi, N. Kamiya, M. Goto (Kyushu Univ.)
38	Stability Control of Food Emulsion by Electrostatic Layer-by-Layer Multicoating using Edible Polyelectrolytes Y. Ito, T. Kondo, I. Morimoto, S. Sato, S. Ichikawa (Univ. Tsukuba)
39	Solid mixing simulation in a spouted bed by the coarse grain model of DEM K. Takabatake[1], M. Sakai[1], M. Ebrahimi[2], J. Khinast[2] ([1]UTokyo, [2]Graz Univ. Technol.)
40	Numerical investigation of the effect of air flow on powder injection in die-filling H. Yao, M. Sakai (UTokyo)
41	Development of a visualization technology for a large-scale granular flow simulation Y. Mori, M. Sakai (UTokyo)

42	Mechanical and sulfuric acid resistance properties of hardened cement treated with acrylic latex co-polymerized with 3-(methacryloyloxy)propyltrimethoxysilane S. Mizumoto[1], M. Iijima[1], J. Tatami[1], T.N. Nguyen[2], Y. Kamiyama[2], M. Mori[2] ([1]Yokohama Nat. Univ., [2]Asahi Kasei Corporation)
43	Mechanical composition of silica nanoparticles on spherical porous particles and the effect of their microstructures on water drying properties at particle film surface M. Hayakawa[1], M. Iijima[1], J. Tatami[1], M. Sato[2], Y. Kakizawa[2], S. Hiroshima[2], M. Koide[2] ([1]Yokohama Nat. Univ., [2]Lion Corporation)
44	Nanostructured La(Sr)MnO3/Yttria-Stabilized Zirconia Cathodes for Intermediate-Temperature Solid Oxide Fuel Cells P. Nanthana, K. Horiguchi, K. Sato (Gunma Univ.)
45	Evaluation of dispersion and flocculation state of nanoparticle slurries by osmotic pressure measurement Tomoki Mori, Takamasa Mori (Hosei Univ.)