

The timetable of the 170th ISIJ Meeting  
(September 16–18, 2015 at Kyushu University, Ito Campus)

	Sept. 16 (Wed)		Sept. 17 (Thu)		Sept. 18 (Fri)	
	AM	PM	AM	PM	AM	PM
<b>Session Room 1</b> Center Zone 2 3rd Fl. 2303	---	---	Technology and history of the iron and related industries in Kyushu area Japan (9:30-17:20)[2,000yen]		Interdisciplinary study on Mietsu naval dock (10:30-15:00)[1,000yen]	
<b>Session Room 2</b> Center Zone 2 2nd Fl. 2203	Development of process technology and fundamental research for the promotion of lime dissolution into slag [Int.1-10](10:40-16:05)		Solidification and structure control 1•2 [34-40] (9:00-11:30)	Advances in understanding and controlling of segregation behavior during solidification (13:00-16:50)[Charge-free]	Fundamentals and applications of refining reaction 1•2 [95-100] (9:40-11:50)	Fundamentals and applications of refining reaction 3 [101-105] (13:00-14:40)
<b>Session Room 3</b> Center Zone 2 2nd Fl. 2204	Fundamental of reduction/ Fundamental of reduction and carburization [1-8] (9:00-11:50)	Approaches to control phenomena in cohesive zone of blast furnace under low coke rate operation [D1-D8](13:00-17:00)	Blast furnace 1•2•3 [41-48] (9:00-12:00)	Young engineer session of ironmaking 1•2•3 [49-58] (13:00-16:40)	Agglomeration/Young engineer session of coke-making [106-113] (9:00-11:50)	Sintering 1•2 [114-119] (13:00-15:10)
<b>Session Room 4</b> Center Zone 2 2nd Fl. 2207	Slag•Dust treatment [9-13] (10:00-11:40)	Properties of liquid materials/ Transport phenomena [14-20] (13:00-15:30)	CO <sub>2</sub> reduction•Slag treatment/Physical properties, structure, and thermodynamics of high-temperature melts 1 [59-66] (9:00-11:50)	Physical properties, structure, and thermodynamics of high-temperature melts 2•3 [67-74] (13:00-15:50)	Continuous casting• Solidification/ Conventional continuous casting•Property of cast metals [120-128] (9:00-12:10)	---
<b>Session Room 5</b> Center Zone 2 2nd Fl. 2208	Electromagnetic processing of materials [21-24] (10:20-11:40)	Novel processing/Introduction of research topics in novel processing forum 1•2 [25-33] (13:00-16:20)	Thermodynamics 1•2 [75-82] (9:00-11:50)	Refractories/Hot metal treatment•Electric furnace/Secondary refining• Inclusion 1•2 [83-94] (13:00-17:30)	Reflecting the social value of TETSU (9:30-11:30)[Charge-free]	---
<b>Session Room 6</b> Shiiki Hall 3rd Fl. Lecture Theater 1	Approaches to sustainable iron and steelmaking system with materials recycling 1•2 [129-134] (9:20-11:30)	Cultural heritage 1•2 [135-141] (13:00-15:30)	Bio-recycling & Pyro-recycling 4 (9:35-14:40)[1,000yen]		Recycle/Clean coal technology [142-149] (9:00-11:50)	---
<b>Session Room 7</b> Shiiki Hall 3rd Fl. Lecture Theater 5	Instrumentation [150-154] (10:00-11:40)	Control/System [155-162] (13:00-15:50)	Crystal structure analysis [377-381] (10:00-11:40)	Elemental analysis [382-386] (13:00-14:40)	Advanced monitoring methods for iron and steel manufacturing processes [Int.21-27](9:00-12:20)	---
<b>Session Room 8</b> Shiiki Hall 3rd Fl. Lecture Theater 2	Basic and applied tribological studies on rolling processes 1•2 [163-168] (9:50-12:00)	Influence of surface oxide scale in working processes (13:00-17:10)[Charge-free]	Data management and modelling for the rolling control technology [D9-D13](9:00-12:00)	To solve problems of hot rolling rolls [D14-D20](13:00-15:50)	Cooling and oxidation scale [189-193] (10:20-12:00)	Rolling and levelling [194-197] (13:00-14:20)
<b>Session Room 9</b> Shiiki Hall 3rd Fl. Lecture Theater 4	---	Joining 1•2 [169-174] (13:00-15:10)	Improvement of efficiency of welding and joining process [175-179] (10:00-11:40)	Advances in processing of powders and powder metallurgy 1•2 [180-188] (13:30-16:40)	Cutting and tribology/ Fracture characteristics and residual stress [198-204] (9:30-12:00)	---
<b>Session Room 10</b> Center Zone 2 2nd Fl. 2201	Feedback to materials design assisted by advanced characterization and modelling Part I (10:00-15:30)[Charge-free]		Feedback to materials design assisted by advanced characterization and modelling Part II (9:00-17:30)[Charge-free]		Stabilities and material properties of austenite phase [D27-D35](9:00-14:40)	
<b>Session Room 11</b> Center Zone 2 2nd Fl. 2202	Recent progress of hydrogen-passive surface on steels to prevent hydrogen embrittlement [Int.11-20](9:15-16:55)		---	Analysis of factors which promote biological steel corrosion [D21-D26](13:00-16:50)	Evaluation and characterization of fouling on steel or slag surface [D36-D43](10:00-15:00)	
<b>Session Room 12</b> Center Zone 2 2nd Fl. 2209	Cold rolled strip steels [205-209] (10:20-12:00)	Electrical steels [210-213] (13:00-14:20)	Structural steel 1•2 [263-269] (9:20-11:50)	Stainless steels 1•2•3 [270-279] (13:00-16:40)	Deformation structure [319-323] (9:50-11:30)	Recrystallization•texture/ Microstructure control of austenite [324-331] (13:00-15:50)
<b>Session Room 13</b> Center Zone 2 2nd Fl. 2210	Phase diagram/Diffusional transformation [214-220] (9:30-12:00)	Medium manganese steels/Bainite [221-227] (13:30-16:00)	Aging•precipitation [280-284] (9:50-11:30)	Martensitic transformation 1•2 [285-294] (13:30-17:00)	Hot-dip coating 1•2 [332-339] (9:10-12:00)	Chemical property [340-342] (13:00-14:00)
<b>Session Room 14</b> Center Zone 2 2nd Fl. 2211	Mechanical properties/ Formability [228-235] (9:10-12:00)	Strength, deformation properties 1•2•3 [236-246] (13:00-17:00)	Austenitic heat resisting steel/Ferritic heat resisting steel 1 [295-301] (9:20-11:50)	Ferritic heat resisting steel 2•3 [302-310] (13:00-16:10)	Ni based alloy 1•2 [343-351] (9:00-12:10)	Strength, deformation properties 4•5 [352-360] (13:00-16:10)
<b>Session Room 15</b> Center Zone 2 3rd Fl. 2304	Hydrogen embrittlement 1•2 [247-252] (9:00-11:10)	Fatigue 1•2/Surface treatment [253-262] (13:00-16:40)	Fracture 1•2 [311-318] (9:10-12:00)	Degradation and life-span of infrastructures (13:00-17:00)[1,000yen]	Hydrogen embrittlement 3•4 [361-368] (9:00-11:50)	Hydrogen embrittlement 5•6 [369-376] (13:00-15:50)
<b>Session Room 16</b> Center Zone 2 4th Fl. 2403	---	Micromechanisms of brittle fracture in bainitic steels and their modeling (13:00-17:00)[Charge-free]	Fundamental factors, analyses and evaluation of hydrogen embrittlement (9:30-16:30)[2,000yen]		Light elements in iron and steel – unsolved problems (9:00-15:00)[1,000yen]	
<b>Session Room 17</b> Center Zone 2 4th Fl. 2404	---	---	ISIJ and JIM joint session Titanium and titanium alloys 1•2•3•4•5 [J1-J19](9:00-17:00)		ISIJ and JIM joint session Titanium and titanium alloys 6•7 [J20-J28](9:00-12:10)	---
<b>JIM-Session Room B</b> Center Zone 1 3rd Fl. 1303	---	---	---		ISIJ and JIM joint session Ultrafine grained materials- fundamental aspects for ultrafine grained structures-1•2 [J29-J35](9:30-12:00)	---
*Banquet (19:00-21:00 Hotel Nikko Fukuoka (Hakata-ku, Fukuoka-shi))[10,000yen]			*Poster Session for Students (12:00-16:00 ICNER 1 Hall) *ISIJ Beer Party (17:30-19:00 COOP Big Dining (Big Sand B1Fl.))[1,000yen]			

[ ] : Lecture Number  
( ) : Lecture Time  
■ : Symposium Please ask to each of symposium room desks directly.

Board Meeting  
\*Process Evaluation and Material Characterization Sept. 17(Thu) 14:40-15:40 Room 7

# Program of the 170<sup>th</sup> ISIJ Meeting (Sept. 16-18, 2015)

## High Temperature Processes

Lecture No.				
Discussion Sessions	Title		Speaker	Page
<b>Approaches to control phenomena in cohesive zone of blast furnace under low coke rate operation</b>				
<b>13:10 ~ 13:35</b>				
D1	Clarification of mechanism of cohesive behavior in blast furnace with the aim of achieving low coke rate operation		T. Orimoto	• • • 405
<b>13:35 ~ 14:00</b>				
D2	Investigation of primary slag melting of sinters in a blast furnace based on microstructure observations and phase diagrams		M. Hayashi	• • • 407
<b>14:00 ~ 14:25</b>				
D3	Influence of thermodynamic property of burden on position of the cohesive zone in blast furnace		S. Ueda	• • • 411
<b>14:25 ~ 14:50</b>				
D4	Physical properties of melts at cohesive and dripping zones of blast furnace		N. Saito	• • • 413
<b>15:00 ~ 15:25</b>				
D5	Evaluation of softening behavior of slag particle bed by new cohesive zone simulator with rapid heating and rapid cooling conditions		K. Ohno	• • • 417
<b>15:25 ~ 15:50</b>				
D6	Role and expectation of mathematical simulation to visualize phenomena in blast furnace		M. Sato	• • • 420
<b>15:50 ~ 16:15</b>				
D7	Microscopic flow analysis in cohesive zone of blast furnace		T. Kon	• • • 424
<b>16:15 ~ 16:40</b>				
D8	ADEM simulation of particle softening behavior in blast furnace		J. Kano	• • • 426

## Processing for Quality Products

Lecture No.				
Discussion Sessions	Title		Speaker	Page
<b>Data management and modelling for the rolling control technology</b>				
<b>9:05 ~ 9:35</b>				
D9	Progress of data science based modeling and rolling technique		A. Kitamura	• • • 428
<b>9:35 ~ 10:05</b>				
D10	Rolling process improvement based on data		K. Ohara	• • • 432
<b>10:05 ~ 10:35</b>				
D11	Development of the rolling load model by genetic programming based on a large quantity of data		S. Nishino	• • • 436
<b>10:45 ~ 11:15</b>				
D12	Adaptation of model prediction error of process control by local regression modeling		Y. Kadoya	• • • 440
<b>11:15 ~ 11:45</b>				
D13	Plan view pattern control for steel plates through constrained locally weighted regression model		H. Shigemori	• • • 444
<b>To solve problems of hot rolling rolls</b>				
<b>13:00 ~ 13:20</b>				
D14	Production of standard hot two-roll type wear simulator and evaluation of wear		A. Yanagida	• • • 448
<b>13:20 ~ 13:40</b>				
D15	Preliminary test on the evaluation method of thermal fatigue by hot forming simulator		J. Yanagimoto	• • • 449
<b>13:40 ~ 14:00</b>				
D16	Examination of sleeve roll for hot rolling		A. Segawa	• • • 450
<b>14:00 ~ 14:20</b>				
D17	Generating method of the oxide scale in hot rolling		S. Fujisaki	• • • 451
<b>14:30 ~ 14:50</b>				
D18	Finite element analysis on wear behavior of hot roll material by hot rolling wear simulator		K. Hayakawa	• • • 453
<b>14:50 ~ 15:10</b>				
D19	Clarification of mechanism of sheet crash by fundamental buckling theory		K. Komori	• • • 455
<b>15:10 ~ 15:30</b>				
D20	Influence of microstructures on abrasive wear characteristics of multi-component white cast iron		K. Yamamoto	• • • 456

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## Microstructure and Properties of Materials

Lecture No.				
Discussion Sessions	Title	Speaker	Page	
<b>Analysis of factors which promote biological steel corrosion</b>				
<b>13:10 ~ 13:40</b>				
D21	Antibacterial activity of copper-alloyed stainless steel contaminated with hydrophobic substance.	K. Hirayama	• • •	458
<b>13:40 ~ 14:10</b>				
D22	(ISIJ Research Promotion Grant) Biogas production from metal waste by microorganisms	S. Wakai	• • •	462
<b>14:10 ~ 14:40</b>				
D23	Effect of sea water alkalization on crude oil souring	Y. Tanji	• • •	465
<b>15:00 ~ 15:30</b>				
D24	(ISIJ Research Promotion Grant) Application of an in-situ investigation technique for metal / microbial simultaneous observation to elucidate their interaction	Y. Miyano	• • •	467
<b>15:30 ~ 16:00</b>				
D25	Biominalization via microbiologically influenced corrosion induced by pseudomonas aeruginosa biofilm	H. Ikegai	• • •	468
<b>16:00 ~ 16:30</b>				
D26	Trial of estimation of adhesion force of biofilm on various substrate	N. Hirai	• • •	471
<b>Stabilities and material properties of austenite phase</b>				
<b>9:00 ~ 9:30</b>				
D27	Stabilization mechanism of austenite by grain refinement	T. Tsuchiyama	• • •	473
<b>9:30 ~ 10:00</b>				
D28	Stabilization effect of hydrostatic pressure generated via martensitic transformation on untransformed austenite	N. Nakada	• • •	475
<b>10:00 ~ 10:30</b>				
D29	Stability and deformation induced martensitic transformation behavior of retained austenite in ferrite matrix of low alloy TRIP steel	N. Koga	• • •	476
<b>10:40 ~ 11:10</b>				
D30	Micromechanical behavior of transformation-induced plasticity-assisted steel monitoring by in-situ neutron diffraction	S. Morooka	• • •	478
<b>11:10 ~ 11:40</b>				
D31	The effects of strain rate on tensile properties of ultra high-strength low alloy TRIP-aided steels	T. Hojo	• • •	482
<b>11:40 ~ 12:10</b>				
D32	Formabilities of si-al ultrahigh-strength TRIP-aided martensitic sheet steel	J. Kobayashi	• • •	484
<b>13:10 ~ 13:40</b>				
D33	TRIP and TWIP effects on tensile deformation behavior in a SUS316L steel	N. Tsuchida	• • •	488
<b>13:40 ~ 14:10</b>				
D34	Cause of serrated flow associated with deformation in austenite	M. Koyama	• • •	490
<b>14:10 ~ 14:40</b>				
D35	Fatigue property under hydrogen atmosphere in austenitic steels with different phase stability	K. Tsuzaki	• • •	492

## Process Evaluation and Material Characterization

Lecture No.				
Discussion Sessions	Title	Speaker	Page	
<b>Evaluation and characterization of fouling on steel or slag surface</b>				
<b>10:05 ~ 10:30</b>				
D36	Analyses of biofilm formed on various metal substrates by FT-IR and Raman spectroscopy	K. Sano	• • •	493
<b>10:30 ~ 10:55</b>				
D37	The effect of inner surface of cooling water pipe on biofilm formation	A. Ogawa	• • •	495
<b>11:05 ~ 11:30</b>				
D38	Inhibition effect of plasma treated oxidation on biofilm formation on steels	C. Kato	• • •	497
<b>11:30 ~ 11:55</b>				
D39	(ISIJ Research Promotion Grant) Bioassay of metal ion by medaka larvae : comparison between zinc and lithium	T. Sano	• • •	499
<b>13:00 ~ 13:25</b>				
D40	Comparative discussion for biofilm formation of polymer films and application to steel coating	T. Kogo	• • •	501
<b>13:25 ~ 13:50</b>				
D41	Investigation for biofilm formation by EQCM method	T. Kougo	• • •	503

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**14:00 ~ 14:25**

D42 Characterization of microbial fuel cell used steel as an anode

Y. Hishikawa . . . 505

**14:25 ~ 14:50**

D43 Selective acquisition of period 4 metal ions in water by biofilm

N. Hirai . . . 507

# Program of the 170<sup>th</sup> ISIJ Meeting (Sept. 16-18, 2015)

## International Organized Sessions

### Development of process technology and fundamental research for the promotion of lime dissolution into slag

10:40 ~ 10:45

Opening Address Y. Kobayashi [Tokyo Inst. Tech.]

10:45-16:00 Chairpersons: N. Saito [Kyushu Univ.], H. Todoroki [Nippon Yakin Kogyo], Y. Kobayashi [Tokyo Inst. Tech.]

10:45 ~ 11:10

Int.-1 (Invited Lecture) Observations on modelling of de-phosphorisation in oxygen steelmaking

Swinburne Univ. of Technology ○G. Brooks · B. Rout · A. Rhamdhani · Z. Li . . . 509

11:10 ~ 11:30

Int.-2 Thermochemistry of heterogeneous CaO-SiO<sub>2</sub>-P<sub>2</sub>O<sub>5</sub>-Fe<sub>x</sub>O dephosphorization slag

Kyoto Univ. ○K. Miwa · M. Hasegawa . . . 513

11:30 ~ 11:50

Int.-3 Effect of additives (alumina, magnesia or calcium fluoride) on dissolution rate of solid CaO into calcium silicate based slags

Nippon Yakin Kogyo ○F. Kirihara, Kyushu Univ. K. Nakasima · N. Saito, Tohoku Univ. S. Sukenaga . . . 514

13:15 ~ 13:35

Int.-4 Preparation and microstructure characterization of high active lime for steelmaking

North China Univ. of Science and Technology ○S. Hao · W. Jiang · Y. Zhang, Northeastern Univ. H. Hao . . . 516

13:35 ~ 13:55

Int.-5 (ISIJ Research Promotion Grant) Effect of CaCO<sub>3</sub> core existed in quicklime on the dissolution of quicklime into molten slag

Tohoku Univ. ○N. Maruoka · H. Nogami . . . 520

13:55 ~ 14:15

Int.-6 Model experiment of solid dissolution behavior under ultrasound irradiation

Nagoya Inst. of Tech. ○K. Okumura . . . 522

14:15 ~ 14:35

Int.-7 Determination of thermal conductivity of dicalcium-silicate based solid solutions

Tokyo Inst. of Tech. ○Y. Kobayashi · Y. Tang · S. Takahashi · T. Sadamoto · R. Endo · M. Susa . . . 526

14:55 ~ 15:20

Int.-8 (Invited Lecture) A Kinetic Process Simulation Model for Basic Oxygen Furnace (BOF): Importance of slag chemistry for BOF operation

McGill Univ. ○In-Ho JUNG · Marie-Aline Van Ende . . . 527

15:20 ~ 15:40

Int.-9 Rheological behavior and empirical model of simulated foaming slag

Kyushu Univ. ○N. Saito, Tohoku Univ. S. Sukenaga, Kyushu Univ. K. Nakashima . . . 531

15:40 ~ 16:00

Int.-10 Influence of P<sub>2</sub>O<sub>5</sub> on dissolution behavior of lime into molten slag

NSSMC ○S. Kakimoto · A. Kiyose · R. Murao . . . 532

16:00 ~ 16:05

Closing remark N. Saito [Kyushu Univ.]

### Recent progress of hydrogen-passive surface on steels to prevent hydrogen embrittlement

9:15 ~ 9:20

Opening Address M. Sakairi [Hokkaido Univ.]

9:20-16:50 Chairpersons: D. Mizuno [JFE steel], M. Sakairi [Hokkaido Univ.], T. Haruna [Kansai Univ.], K. Fushimi [Hokkaido Univ.], I. Muto [Tohoku Univ.], H. Katayama [National Institute for Materials Science]

9:20 ~ 10:10

Int.-11 (Invited Lecture) Characterization of hydrogen-metal interactions in engineering alloys: challenges and opportunities

Univ. of Virginia ○J. Scully . . . 533

10:20 ~ 11:10

Int.-12 (Invited Lecture) Negative and positive effects of hydrogen on tensile behavior in high-mn austenitic steels

Kyushu Univ. ○K. Tsuzaki · M. Koyama . . . 534

11:20 ~ 11:45

Int.-13 Behavior of hydrogen absorption to iron promoted by additional elements

Kansai Univ. ○T. Haruna · Y. Nii . . . 535

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**13:10 ~ 14:00**

**Int.-14** (Invited Lecture) New experimental approaches to the static and dynamic determination of hydrogen in steel

Johannes Kepler Univ. Linz ○A. Hassel . . . 537

**14:10 ~ 14:35**

**Int.-15** A microelectrochemical approach for detecting hydrogen permeation of steel

Tohoku Univ. ○I. Muto · Y. Sugawara · N. Hara . . . 538

**14:35 ~ 15:00**

**Int.-16** Evaluation of hydrogen permeation by surface potential measurement

NIMS ○H. Katayama . . . 540

**15:10 ~ 15:35**

**Int.-17** In-situ potential measurements studying the depassivation/repassivation mechanisms of chromium work rolls during cold-rolling

CEST Competence Centre for Electrochemical Surface Technology ○G. Schimo,  
Christian Doppler Laboratory for Combinatorial Oxide Chemistry A. Hassel,  
Max Planck Institute for Iron Research S. Merzlikin, voestalpine Stahl GmbH D. Paesold . . . 541

**15:35 ~ 16:00**

**Int.-18** Hydrodynamic perturbation for local detection of hydrogen permeation into steel sheet

Hokkaido Univ. ○K. Fushimi · M. Jin · Y. Yamamoto . . . 545

**16:00 ~ 16:25**

**Int.-19** Hydrogen permeation current responses of iron to potential modulation in an electrochemical hydrogen permeation cell

Tokyo Inst. of Tech. ○E. Tada · A. Nishikata . . . 546

**16:25 ~ 16:50**

**Int.-20** Hydrogen permeation behavior of steels with formed scratch during wet and dry corrosion

Hokkaido Univ. ○M. Sakairi · K. Igarashi . . . 548

**16:50 ~ 16:55**

Closing remark M. Kimura [KJFE Steel]

### Advanced monitoring methods for iron and steel manufacturing processes

**9:00 ~ 9:10**

Opening Y. Deguchi [Tokushima Univ.]

**9:10-12:20**

**Chairpersons: R. Yoshihie [Nagoya Univ.], S. Kahiwakura [Tohoku Univ.]**

**9:10 ~ 9:40**

**Int.-21** (Invited Lecture) Quantitative analysis of vanadium, titanium and phosphorus elements in steel by laser-induced breakdown spectroscopy

Wuhan National Laboratory for Optoelectronics Huazhong Univ. of Science and Technology ○X. Zeng . . . 549

**9:40 ~ 10:00**

**Int.-22** Temperature effect on quantitative elemental detection of laser induced breakdown spectroscopy

Tokushima Univ. ○R. Liu · Y. Deguchi . . . 551

**10:00 ~ 10:20**

**Int.-23** (ISIJ Research Promotion Grant) The trial production of steel-scrap sorter with the aid of laser-induced breakdown spectroscopy

Tohoku Univ. ○S. Kashiwakura · K. Wagatsuma . . . 555

**10:40 ~ 11:10**

**Int.-24** (Invited Lecture) An innovative measurement system for iron-making processes by integrating the laser induced breakdown spectroscopy (LIBS) with the 3D profile measurement system

Department of Mechanical Engineering, National Taiwan Univ. of Science and Technology ○F. Shiou . . . 557

**11:10 ~ 11:40**

**Int.-25** (Invited Lecture) Application of laser-induced breakdown spectroscopy to real-time elemental detection of process monitorings

Xi'an Jiaotong Univ. ○Z. Wang . . . 558

**11:40 ~ 12:00**

**Int.-26** LIBS measurement of gaseous sb in simulated flue gas

Nagoya Univ. ○R. Yoshiie · R. Ishikawa · Y. Ueki · I. Naruse . . . 561

**12:00 ~ 12:20**

**Int.-27** Quantitative elemental detection of LIBS for iron and steel making processes

Tokushima Univ. ○Y. Deguchi . . . 564

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## High Temperature Processes

Lecture No.	Title	Speaker	Page
<b>Plenary Session</b>			
<b>Fundamental of reduction</b>			
1	Effect of reducing gas composition on the reducibility of calcium ferrite	S. Mataoka	• • • 566
2	Reduction behavior of multicomponent calcium ferrite with CO-CO <sub>2</sub> -H <sub>2</sub> gas mixture	S. Takeda	• • • 567
3	Gasification behavior of graphite with CO <sub>2</sub> -H <sub>2</sub> gas mixtures	R. Kubo	• • • 568
4	Effect of CO-H <sub>2</sub> -N <sub>2</sub> gas mixture and Al <sub>2</sub> O <sub>3</sub> , MgO contents on reduction rate of artificial iron ore under rising temperature	S. Fujiwara	• • • 569
<b>Fundamental of reduction and carburization</b>			
5	Morphology observation of reduced self-reducing dust pellets heated by electric resistance furnace and microwave heating furnace.	M. Doji	• • • 570
6	In-situ XRD observation of carbothermic reduction of hematite powders using microwaves	H. Tanaka	• • • 571
7	Effect of sulfur on reduction and carburization of carbonaceous material and iron ore composite	K. Matsuda	• • • 572
8	Effect of sulphur on carburization and melting behavior of iron	T. Murakami	• • • 573
<b>Slag • Dust treatment</b>			
9	Effect of cooling condition on precipitated phase in steel making slag	H. Tate	• • • 574
10	Reduction of titanium bearing slag to titanium silicide	Z. Chen	• • • 575
11	Recovery of zinc and lead from electric arc furnace dust by using selective chlorination reaction	H. Kitao	• • • 576
12	Influence of temperature on the selective chlorination and evaporation reaction of Zn and Pb contained in EAF dust	G. Sun	• • • 577
13	Phase relation during reduction of CaO treated EAF dust	T. Kanamori	• • • 578
<b>Properties of liquid materials</b>			
14	Effect of liquid-state enthalpy on temperature dependence of pure fluorides viscosities	N. Takahira	• • • 579
15	Effect of the slag composition on behavior of slag foaming	M. Ohta	• • • 580
16	Effect of alkali oxide (R <sub>2</sub> O) additions to the absorption ability of tundish fluxes	I. Sohn	• • • 581
<b>Transport phenomena</b>			
17	(ISIJ Research Promotion Grant) Observation of bubble behavior at the ionic solution/liquid metal interface with electrocapillary method	E. Takeuchi	• • • 582
18	Electrocapillarity and emulsification at the interface of the ionic solution and the liquid metal	Y. Hiyama	• • • 583
19	Analysis of molten metal - slag interfacial flow due to the gas bubble rising	R. Nashimoto	• • • 584
20	Construction of three-dimensional simulation program for the analysis of the particle injection	M. Nakano	• • • 585
<b>Electromagnetic processing of materials</b>			
21	Electromagnetic sensor just below cc mold by using magnetic transformation of steel	H. Harada	• • • 586
22	Effect of a static magnetic field on molten tin flow in packed bed filled with copper ball	H. Ishii	• • • 587
23	Effect of vibrating electromagnetic force on concentration boundary layer formed in the vicinity of anode	T. Yokota	• • • 588
24	Effect of applied magnetic field to aluminum anodization	S. Prabowo	• • • 589
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