

## The Timetable of the 163rd ISIJ Meeting

|   | March 28 (Wed)   |   | March 29 (Thurs)  |   | March 30 (Fri)  |  |   |
|---|--|---|---|---|---|--|---|
|   | a.m.   | p.m.  | a.m.  | p.m.  | a.m.  | p.m.   |   |
| Room1 (C-201)   | Coke making technology /Young engineer session of coke-making [1-9] (9:00-12:10)   | General assembly  | (D) Cokemaking technology for low-quality and unused carbon resources [D1-13] (9:00-17:20)      |   | New agglomeration process /Blast furnace and shaft furnace [71-77] (9:30-12:00)   | Evaluation of advanced agglomerates /Mathematical model of blast furnace [78-86] (13:00-16:10)   |   |
| Room2 (JIM-R) (C-301)   | Process control for sintering1·2 [10-16] (9:20-11:50)  |   | (D) Recent progress on advanced mathematical model of blast furnace [D14-21] (10:20-16:15)      |   | Young engineer session of ironmaking1·2 [87-93] (9:30-12:00)  | ISIJ and JIM joint session Fundamentals and application of microwave processing1·2 [J29-35] (13:00-15:30)  |   |
| Room3 (A-107)   | Blast furnace reactions1·2 [17-24] (9:10-12:00)  |   | ----  |   | Technical developments and recent aspects for researches on high-temperature thermophysical1·2 [94-101] (9:00-11:50)                | Technical developments and recent aspects for researches on high-temperature thermophysical3 [102-107] (13:00-15:00)                             |   |
| Room4 (A-108)   | Inclusion [25-28] (10:40-12:00)  |   | Introduction of novel processing forum [40-43] (10:00-11:20)                                    |   | Transport phenomena1·2·3 [44-53] (13:20-17:00)  | Converter /Secondary refining ·Electric furnace [108-115] (9:10-12:00)   | Hot metal treatment /Refractories3 [116-123] (13:10-16:00)  |
| Room5 (A-106)   | Thermodynamics /Recycling [29-34] (9:30-11:40)   |   | (Int.) Innovations and future directions for BOF steelmaking processes [Int.1-10] (10:00-15:55) |   | Fundamentals and applications of non-metallic inclusions in solid steel (9:15-16:30) [Charge-free]                                  |  |   |
| Room6 (A-105)   | Continuous casting1 [35-39] (9:30-11:10)   |   | Ceremony of conferment of the honorary membership and prize awarding                            | Continuous casting2·3 [54-60] (9:20-11:50)  | Refractory1·2 /Mould flux [61-70] (13:00-16:40)   | Fundamental of solidification1·2 [124-130] (9:20-11:50)  | Fundamental of solidification3 [131-134] (13:30-14:50)  |
| Room7 (A-104)   | Utilization of biotechnology [135-137] (10:50-11:50)   |   |   | (D) Automobile recycling from material industry's perspective: Part1 [D22-28] (9:00-11:50)  | Pyrometallurgy based separating and recycling (13:00-16:40) [2,000yen]  | Present status of EAF dust treatment in the world (9:00-16:00) [3,000yen]  |   |
| Room8 (A-102)   | Utilization technology of slag and dust1·2 [138-144] (9:30-12:00)  |   | Special lecture meeting   | ----  | Establishment of low-carbon ironmaking system by using carbon recycling technologies (13:00-17:00) [2,000yen]                       | Production of green energy and the use for ironmaking and steelmaking (9:00-16:20) [Charge-free]   |   |
| Room9 (A-208)   | (D) Advanced system integration for preserving, sharing and improving work quality in steel plants [D29-32] (9:20-12:00) |   |   | Instrumentation1·2 [145-152] (9:00-11:50)   | Instrumentation3·Control /System [153-160] (13:30-16:20)  | ----   | Nowadays safety: security and holonomy (13:00-16:30) [Charge-free]  |
| Room10 (A-207)  | Control technology for free cutting-5 /Cutting [161-168] (9:00-11:50)  |   |   | Testing methods of steel tube formability and its standardization (10:00-16:15) [2,000yen]  |   | Steel structure production and fracture /Tube and pipe [175-180] (9:30-11:40)  | Today and future outlook of long life/life extension technologies of steel structures (13:00-17:00) [Member2,000yen/Non-member3,000yen] |
| Room11 (A-206)  | (D) Advanced tribological studies on hot rolling [D33-38] (9:00-11:40)   | (D) Research and development towards high-precision simulation of forming processes [D39-46] (9:55-15:30) |   | Cooling /Scale [181-188] (9:00-11:50)   | Rolling1·2 [189-197] (13:00-16:10)  |  |   |
| Room12 (A-204)  | ----   | Manufacturing technology of high quality and high functional bar and wire1·2 [169-174] (9:40-11:50)       |   | Cold rolling /Hot rolling1·2 [227-236] (13:00-15:30)  | Mechanical property1·2 /Strength, deformation behavior [279-289] (13:00-17:00)  |  |   |
| Room13 (A-203)  | Fracture·Deformation behavior1·2 [198-205] (9:00-11:50)  | 13:30   |   | Pipe and machine structural steel1·2 [237-243] (9:20-11:50)   | New approaches to the nondestructive damage evaluation with nonlinear phenomena of structural materials (13:00-17:00) [Charge-free] | Investigation of mechanism and detection of hydrogen evolution and absorption reactions induced by atmospheric corrosion (9:30-16:30) [1,000yen] |   |
| Room14 (A-101)  | Structure control1·2 [206-213] (9:00-11:50)  |   |   | Dual phase steels /Dual phase steels and martensite [244-251] (9:00-11:50)  | Hydrogen embrittlement1·2 [252-260] (13:00-16:10)   | Microstructure formation1·2 [290-296] (9:20-11:50)   | Martensitic transformation1·2 [297-305] (13:00-16:10)   |
| Room15 (A-201)  | ----   | 17:00   |   | Nanoscale inhomogeneities in steels and their control -Functions of alloying elements (9:00-17:00) [Charge-free]                          |   | Toward effective 3D4D analysis for materials research (9:00-16:30) [1,000yen]  |   |
| Room16 (A-202)  | The world technical trends in surface hardening and automotive steels (9:30-12:30) [1,000yen]                            |   |   | ----  | Science and latest technologies of stainless steel (13:00-17:00) [Charge-free, Textbook:4,000yen]                                   | Physical metallurgy of heat-resistant steels and alloys II (9:00-16:30) [2,000yen]   |   |
| Room17 (A-305)  | Austenitic heat resisting steels1·2 [214-222] (9:20-12:30)   | Ferritic heat resisting steels1 [261-264] (10:30-11:50)   |   | Ferritic heat resisting steels2·3 [265-271] (13:00-15:30)   | Titanium and its alloys /Stainless steel1 [306-312] (9:20-11:50)  | Stainless steel2·3 [313-319] (13:00-15:30)   |   |
| Room18 (JIM-Q) (A-306)  | Precipitation and segregation [223-226] (9:20-10:20)   | ISIJ and JIM joint session Titanium and its alloys1·2·3·4 [J1-15] (9:20-16:10)                            |   | Electrical steel sheets1·2 [320-326] (9:00-11:30)   | Electromagnetic materials [327-330] (13:00-14:20)   |  |   |
| Room19 (A-307)  | (D) Characterization of advanced materials with complicated structures [D47-54] (9:00-12:40)                             | Crystal structure analysis [342-345] (10:30-11:50)  |   | Elemental analysis/Others [346-354] (13:30-16:40)   | ----  | Hot-dip coating·Electroplating·Painting /Mechanism of corrosion and corrosion protection /Hydrogen absorption [331-341] (13:00-17:00)            |   |
| Room20 (JIM-I) Faculty of Education and Human Sciences[EdHS] Lecture Hall 7, 1st Flr. 7-103 | ----   | ----  |   | ISIJ and JIM joint session Ultrafine grained materials-fundamental aspects for ultrafine grained structures-1·2·3·4 [J16-28] (9:30-15:30) |   |  |   |
|   |  | Banquet* (18:30-20:30 Rose Hotel Yokohama) [10,000yen] *Sichuan and French Cuisine                        |   | Poster Session for Students (12:00-15:00 University Hall)<br><br>ISIJ Beer Party (17:30-19:00 Cafeteria I)                                |   |  |   |

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

● Board Meeting:  
Instrumentation, Control and System Engineering March 29(Thurs) 12:00-12:50 Room9  
Processing for Quality Products March 29(Thurs) 12:00-13:00 Room11

## High Temperature Processes

| Lecture No.  | Title  | Speaker       | Page     |
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| <b>Discussion Sessions</b>   |  |               |          |
| <b>Cokemaking technology for low-quality and unused carbon resources</b> |  |               |          |
| D1   | Development of the coke making technology using high-performance caking additive   | T.Shishido    | • • • 1  |
| D2   | Production of caking additive by low-quality coal refining   | T.Takanohashi | • • • 5  |
| D3   | Additive effects of several kinds of hydroaromatic compounds upon enhancement of fluidity of non- or slightly- caking coal | M.Sugano      | • • • 9  |
| D4   | Preparation of high strength coke from brown coal by means of binderless hot briquetting and subsequent carbonization      | J.Hayashi     | • • • 13 |
| D5   | Coking technologies using heavy oil bitumen  | Y.Sekine      | • • • 17 |
| D6   | Analysis of defect generation behavior during plastic phase  | K.Fukada      | • • • 21 |
| D7   | Development of simultaneous simulation model of bubble nucleation, growth and coalescence in cokes production process      | K.Taki        | • • • 25 |
| D8   | Examination of co-pyrolysis behavior of low-grade coal and binder  | R.Ashida      | • • • 29 |
| D9   | Influences of the nitrogen and sulfur present in coal on maximum Gieseler fluidity   | N.Tsubouchi   | • • • 33 |
| D10  | Evaluation of contraction rate and size of inertinite in coal  | Y.Kubota      | • • • 37 |
| D11  | Coking technology for mixture of coal and woody biomass  | Y.Ueki        | • • • 41 |
| D12  | Strength evaluation model for coke containing low-quality or unused carbon resources                                       | Y.Saito       | • • • 45 |
| D13  | Investigation of carbon structure at coal-binder interface by SEM-EDAX, Laser-Raman Mapping and XRD techniques             | A.Sharma      | • • • 49 |
| <b>Recent progress on advanced mathematical model of blast furnace</b>   |  |               |          |
| D14  | Development of mathematical model of blast furnace based on behaviors of dispersed phases                                  | H.Nogami      | • • • 53 |
| D15  | Development of DEM model for analyzing in-furnace phenomena of blast furnace   | S.Ueda        | • • • 57 |
| D16  | Dynamic simulation in packed bed of blast furnace using DEM-CFD  | S.Natsui      | • • • 61 |
| D17  | Application of MPS method to liquid flow modeling in blast furnace   | K.Nishioka    | • • • 65 |
| D18  | Trickle flow behavior in the lower part of blast furnace   | I.-H.Jeong    | • • • 69 |
| D19  | Numerical simulation on liquid dripping from cohesion zone by MPS method   | T.Kon         | • • • 73 |
| D20  | Local blockage of fine particles transported by updraft through a packed bed   | H.Kawai       | • • • 77 |
| D21  | Simulation of crack formation in an anisotropic coke using discrete element method   | S.-Y.Kim      | • • • 81 |

## Environmental, Energy and Social Engineering

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| <b>Discussion Sessions</b>  |  |               |           |
| <b>Automobile recycling from material industry's perspective: Part1</b> |  |               |           |
| D22   | (Nishiyama Commemorative Prize)Importance of scrap sorting technology for management of steel alloying element associated with the end of life vehicle recycling | K.Matsubae    | • • • 85  |
| D23   | Estimation on distribution of copper contents in steel scrap   | N.Fujitsuka   | • • • 88  |
| D24   | Evaluation of material recyclability from end-of-life vehicle  | Y.Takahashi   | • • • 91  |
| D25   | Trade-off analysis between environmental impact and upgrading of scrap steel :Recyclability evaluation of scrap steel in terms of TMR                            | E.Yamasue     | • • • 95  |
| D26   | Rapid determination of chromium in steel scraps using laser-induced plasma spectrometry  | S.Kashiwakura | • • • 99  |
| D27   | Material flow analysis of nickel, chromium and molybdenum by using WIO-MFA   | K.Nakajima    | • • • 103 |
| D28   | Substance flow analysis of alloying elements in steel associated with international trade based on WIO-MFA model   | H.Ohno        | • • • 107 |

## Instrumentation, Control and System Engineering

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| <b>Discussion Sessions</b>  |   |             |                   |
| <b>Advanced system Integration for preserving, sharing and improving work quality in steel plants</b> |   |             |                   |
| D29   | Advanced system integration for preserving, sharing and improving work quality in steel plants                              | T.Sawaragi  | • • • VOL. 24-634 |
| D30   | Development of a support system for manufacturing process design of steel plates  | T.Shirasaka | • • • VOL. 24-622 |
| D31   | Knowledge acquisition by using machine learning for production planning learning support system in steel production systems | I.Hatono    | • • • VOL. 24-626 |
| D32   | An agent-based approach for decision-support in production scheduling   | H.Tamaki    | • • • VOL. 24-630 |

## Processing for Quality Products

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| D33  | Influence of iron oxide on lubricating properties in hot rolling                                    | S.lida       | • • • 111 |
| D34  | Behavior of coefficient of friction in hot rolling of steel sheet with different Si contents        | Y.Satta      | • • • 115 |
| D35  | A discussion on scale behavior in hot copper rolling  | K.Hara       | • • • 119 |
| D36  | Evaluation of work roll for hot rolling by rolling simulator  | S.Yokosuka   | • • • 121 |
| D37  | Formation condition of scale layer on work roll in hot steel rolling                                | K.Nakazawa   | • • • 125 |
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| <b>Research and development towards high-precision simulation of forming processes</b> |   |              |           |
| D39 (Invited Lecture)  | Perspective on current feature and problems of plastic constitutive model                           | K.Ito        | • • • 133 |
| D40  | Measurements of material function using biaxial tensile test and press simulation                   | S.Nakajima   | • • • 137 |
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| D42  | Improvement on CAE model for accurate torsional springback prediction in high strength part forming | A.Ishiwatari | • • • 145 |
| D43 (Invited Lecture)  | Recent trend to improve prediction accuracy in forging simulation technology                        | S.-Y.Kim     | • • • 149 |
| D44  | Development of FEM forging system for prediction of microstructure in hot forging of carbon steel   | N.Yukawa     | • • • 153 |
| D45  | Numerical simulations for dynamic-unsteady-unstable phenomena in HOT rolling process                | Y.Nakamura   | • • • 157 |
| D46  | Numerical simulation of ductile fracture behaviour using a microscopic model                        | K.Komori     | • • • 161 |

## Process Evaluation and Material Characterization

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| <b>Characterization of advanced materials with complicated structures</b> |  |           |           |
| D47 (Invited Lecture)   | Local structure and chemical state characterization of steels and relating materials using X-ray absorption spectroscopy | K.Shinoda | • • • 162 |
| D48   | Characterization of nano-sized precipitation in steel using TEM and XAFS   | Y.Tanaka  | • • • 166 |
| D49   | Factor analysis of the XPS spectra obtained from NiAl alloy  | N.Ohtsu   | • • • 170 |
| D50   | Evaluation of plastic strain with mechanical loading by x-ray line profile analysis                                      | M.Kumagai | • • • 171 |
| D51   | Development of rapid X-ray diffraction system at high temperatures for observation of sintering                          | M.Kimura  | • • • 175 |
| D52 (Invited Lecture)   | Application of two dimensional detector to metallic material evaluation by using synchrotron radiation                   | T.Shobu   | • • • 178 |
| D53   | Microstructural evolution of high-Mn austenitic steels with twinning-induced plasticity                                  | S.Sato    | • • • 181 |
| D54   | Characterization of microscopic strain and stress in polycrystalline material using white X-ray microbeam diffraction    | E.P.Kwon  | • • • 185 |

# International Organized Sessions

## High Temperature Processes

2012/03/29 Lecture Room 5

### Innovations and future directions for BOF steelmaking processes

- 10:00 ~ 10:05  
Opening address Y.Kobayashi(Tokyo Inst. of Tech.)
- 10:05 ~ 11:55 Chairperson:Y.Kobayashi(Tokyo Inst. of Tech.)
- 10:05 ~ 10:35  
Int. 1 Development of simulation program for hot-metal dephosphorization processes ... 188  
-The activity of the ISIJ Research Group "Process simulation for dephosphorization of pig iron by multi-phases"-  
Waseda Univ. ○K.Ito·M.Mori
- 10:35 ~ 11:05  
Int. 2 (Invited Lecture)Bloated droplet model of oxygen steelmaking ... 191  
Swinburne Univ. of Tech. ○G.Brooks, Univ. of Wollongong N.Dogan, McMaster Univ. K.Coley
- 11:05 ~ 11:25  
Int. 3 Effect of changes in slag basicity and stirring intensity on hot metal dephosphorization ... 195  
NSC ○N.Sasaki·Y.Ogawa·K.Miyamoto
- 11:25 ~ 11:55  
Int. 4 (Invited Lecture)Thermodynamic database and kinetic simulation for BOF process ... 199  
McGill Univ. ○I.-H.Jung·M.-A.Van Ende·W.-Y.Kim
- 13:10 ~ 14:30 Chairperson:N.Maruoka(Tohoku Univ.)
- 13:10 ~ 13:40  
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-A new direction for research in the basic oxygen converter  
Tata Steel ○C.McDonald
- 13:40 ~ 14:00  
Int. 6 Development of hot metal dephosphorization with CaO powder top blowing ... 204  
Sumitomo Metals ○T.Tamura·M.Miyata·Y.Higuchi, Formerly Sumitomo Metals T.Matsuo
- 14:00 ~ 14:30  
Int. 7 (Invited Lecture)The effect of solid particles on liquid viscosity and slag foaming ... 208  
Royal Inst. of Tech. ○D.Sichen
- 14:40 ~ 15:50 Chairperson:N.Sasaki(NSC)
- 14:40 ~ 15:10  
Int. 8 (Invited Lecture)Reduction of dephosphorization slags using slag modification method in a hot metal bath ... 212  
Northeastern Univ. of China ○M.Jiang·D.Wang·C.Liu
- 15:10 ~ 15:30  
Int. 9 Condensation of phosphorus as the  $2\text{CaO}\cdot\text{SiO}_2\text{-}3\text{CaO}\cdot\text{P}_2\text{O}_5$  solid phase in the  $\text{CaO-FeO-SiO}_2$  flux system ... 213  
The Univ. of Tokyo ○H.Matsuura·X.Yang·X.Gao·F.Tsukihashi
- 15:30 ~ 15:50  
Int. 10 Influence of formation layer around CaO on the dissolution rate in steelmaking slag ... 217  
Tohoku Univ. ○N.Maruoka·A.Ishikawa·H.Shibata·S.Kitamura
- 15:50 ~ 15:55  
Closing remark S.Kitamura(Tohoku Univ.)

## High Temperature Processes

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| 5                              | Evaluation of affector of sulfur distribution in coke manufacturing  | K.Nangoh    | • • • 225         |
| 6                              | Effect of coal moisture and bulk density on shrinkage of coke  | A.Kotani    | • • • VOL. 24-789 |
| 7                              | The problems and countermeasures against rising extrusion load   | S.Koge      | • • • VOL. 24-786 |
| 8                              | Enhancement of the capacity for transporting coke to CDQ   | H.Ishikawa  | • • • 226         |
| 9                              | Numerical analysis of dust diffusion from coke oven plant  | N.Saito     | • • • VOL. 24-788 |
| 10                             | Plant test of optimizing coke breeze coating condition at HPS process  | T.Higuchi   | • • • VOL. 24-792 |
| 11                             | Void structure of granulated raw material bed with dry particles addition<br>(Development of RF-MEBIOS(return fine mosaic embedding for iron ore sintering method)<br>process-4) | Y.Yamaguchi | • • • VOL. 24-195 |
| 12                             | Effect of installed RF-MEBIOS process at Kashima No.3 sinter plant<br>(Development of RF-MEBIOS process-5)   | Y.Nakagawa  | • • • VOL. 24-196 |
| 13                             | (Scientific Achievement Merit Prize)Process study on iron ore sintering-for improvements of<br>resources flexibility and environmental load -                                    | E.Kasai     |                   |
| 14                             | Effect of coke breeze distribution on combustion rate of quasi-particles   | H.Ohgi      | • • • 227         |
| 15                             | Development of pot test with segregation charging<br>(Improvement of pot test- II)   | M.Hara      | • • • VOL. 24-795 |
| 16                             | Effect of localized vertical slit in sintering bed on sinter strength  | T.Yamamoto  | • • • VOL. 24-796 |
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