

Contents of the Technical Papers for the 69th Grand Lecture

Meeting of The Iron and Steel Institute of Japan.

C O N T E N T S

Lect. No.	Title	Lecturer
1	On the Condition of Production of High Quality Pellet.	Dr. Koretaka KODAMA, et alii. ...581
2	On the Swelling of Marcona Iron Ore Pellet during Reduction.	Dr. Mayumi YOSHINAGA, et alius. ...583
3	Properties of Blast Furnace Burdens during Reduction.	Keiki FUJITA, et alii. ...586
4	A Study on the Permeability of Pellet in the Blast Furnace.	Hideo KANOSHIMA, et alii. ...590
5	Effect of Size Distribution of Raw Materials on Pelletizing.	Seiichi YASUI, et alii. ...593
6	The Pelletizing and Blast Furnace Operating Test by Using West Australian Ores. (Yampi Ores)	Tōru KADOWAKI, et alii. ...595
7	Blast Furnace Practice with Import Marcona Pellet up to 80% in Burden.	Yasuyoshi MIZUNO, et alii. ...600
8	Influences of the Permeability and the Suction on Sintering Characteristics.	Masahiro MAEKAWA, et alius. ...603
9	Relation between the Size Distribution of Sintering Materials and Sintering Properties. (The index of coarse and fine to sintering properties—I)	Kōji IWATSUKI, et alii. ...606
10	On the Sintering test of Manganese Ore.	Kōsei OKIGAWA, et alii. ...608
11	Statistic Analyses on Recent Operation at Kukioka Sintering Plant.	Yoshinori UMEZU. ...612
12	On Thermal Conductivity of Iron Ore.	Masao HIRATO, et alii. ...614
13	Measurement of Flame Temperature in the Tuyer Combustion Zone.	Tsutomu KATAYAMA, et alii. ...616
14	Fundamental Experiments on Transportation of Coal-Oil Slurry. (Study on coal-oil slurry injection into blast furnace—I)	Hiroshi MATSUOKA, et alii. ...618
15	Injection Apparatus and Driving Technique. (Study on coal-oil slurry injection into blast furnace—II)	Yoshimitsu JŌMOTO, et alii. ...620
16	Operation of Blast Furnace with Coal-Oil Slurry Injection. (Study on coal-oil slurry injection into blast furnace—II)	Bunji ETŌ, et alii. ...623
17	Study on a Large Quantity of Fuel Oil Injection into a Blast Furnace. (Fundamental study on fuel oil injection into a blast furnace—II)	Toshimitsu OGATA, et alii. ...625
18	Blast Furnace Oxygen Enrichment with Simultaneous Injection of Heavy Oil.	Kōichi KURODA, et alii. ...628
19	Influence of Alkali, Zinc and Carbon on Wearing of Blast Furnace Refractories. (Study on wearing mechanism of blast furnace linings—V)	Masayoshi TANAKA, et alii. ...630

To be held on April 5~7, 1965 at University of Tokyo.

20	Mixing Efficiency of Pekay Mixer and Drum Mixer for Pellet Feed.	Minoru YAMATE, et alii. ...633
21	On the 3rd Repair of Kokura No. 2 Blast Furnace.	Michiyasu YOSHIKI, et alii. ...635
22	On the Construction of Tōkai Ore Handling and Beneficiation Plant.	Masayuki KAWABE, et alii. ...638
23	On the Construction of Tōkai No. 1 D. L. Type Sintering Plant.	Takeshi KITAGAWA, et alii. ...640
24	On the Construction of No. 1 Blast Furnace at Tōkai Works.	Akira TAYAMA, et alii. ...642
25	Relining of Hirohata No. 2 Blast Furnace and Its Operation after Blowing-in.	Kenji KOBAYASHI, et alii. ...645
26	Reduction of Iron Ore by Hydrogen with Fluidized-Bed Reactor of 12 cm Diameter. (Study on fluidized reduction of iron ore—I)	Ryūtarō MATSUMOTO, et alii. ...647
27	Reduction of Iron Ore by Hydrogen with Fluidized-Bed Reactor of 30 cm Diameter. (Study on fluidized reduction of iron ore—II)	Ryutaro MATSUMOTO, et alii. ...649
28	Reduction of Magnetite and Wüstite Prepared by Partial Reduction of Hematite Powder. (Studies on the reduction of iron oxides—IV)	Masanori TOKUDA, et alius. ...651
29	Optimum Slag Composition for the Blast Furnace Smelting of Titaniferous Ores.	Atsumi OHNO, et alius. ...654
30	On the Constitution of Phosphor Contained in Undersea Iron Sand.	Takehiko SAKATA, et alius. ...656
31	Studies on Thermo-Magnetic Separation for Iron Sand.	Taizō NAKATA, et alii. ...659
32	On the Improvement upon the Reduction by Rotary Kiln. (Study on the pre-reduction of iron sand with a rotary kiln—VII)	Hideo ARAKAWA. ...661
33	Production on the Pellet Including Coal. (Studies on the iron sand pellet—I)	Takashi KOBAYASHI, et alii. ...664
34	Smelting Test of Iron Sand Pellet by Small Electric Furnace.	Kouhei KOMUKAI, et alii. ...667
35	On the Recovery of Zinc and Bismuth in Iron Blast Furnace Dust.	Akihisa HARADA, et alii. ...669
36	Studies on Bonding Mechanism of Briquette from Blast Furnace Flue Dust.	Kinichi SUGAWARA, et alii. ...671
37	Effects of Deposited Carbon on the Reduction of Iron Ore by CO.	Yōichi ONO, ei alii. ...673
38	On the Irregularity of the Reduction Rate during the Iron Ore Reduction at the Temperatures between 400°C~900°C.	Kōichi FUKUNAGA, et alii. ...675
39	On the Cut off Point of the Reduction Rate during the Iron Ore Reduction at the Temperatures between 900°C~1300°C	Hideyuki YOSHIKOSHI, et alii. ...678
40	On the Forming Process of Crack in Sinter during Reduction.	Tetsurō TAKEMURA, et alii. ...681
41	On Degradation of Sinter during Chemical Reduction.	Takehiro HORIO, et alii. ...683
42	On the Reduction of Synthesized Hercynite with Hydrogen.	Mamoru YAMADA, at alius. ...686
43	Relation between the Reactivity of Coke and the Rate of Reduction of Iron Ores. (Studies for the improvement in blast furnace practice—VI)	Fumio NAKAMURA, et alii. ...689

44	Characteristics of Foundry Coke. (Study on manufacturing conditions of the coke used for a mammoth B. F.— I)	Masaki TOKUHISA, et alii.	692
45	The Change of Characteristics of Coke in the Blast Furnace under the Special Operation.	Hiroyuki NAKAMA, et alii.	694
46	Effect of Top Pressure on the Gas Flow in Blast Furnace.	Tomorō HAGIWARA, et alii.	696
47	On the Viscosity of Blast Furnace Slag.	Michiharu HATANO, et alii.	698
48	Mathematical Model for Desulphurization in Blast Furnace.	Masatake TATEOKA, et alii.	700
49	Some Considerations on Silica Source and Reducing Temperature. (On the reduction of silicon in blast furnace— I)	Cheaul Woo KIM, et alii.	703
50	On the Supersonic Flow Conditions of Geaseons Oxygen at a Laval Nozzle. (On the kinetics of the blowing reactions in basic oxygen converter— I)	Kiminari KAWAKAMI.	706
51	On the Structure of Oxygen Jet Emerged from a Laval Nozzle. (On the Kinetics of the blowing reactions in basic oxygen converter— II)	Kiminari KAWAKAMI.	708
52	On the Operation of Blowing Test in Basic Oxygen Converter. (On the kinetics of the blowing reactions in basic oxygen converter— III)	Takashi FUJII, et alii.	711
53	On the Kinetics of the Oxidation-Reaction in Steel-Bath. (On the kinetics of the blowing reactions in basic oxygen converter— IV)	Kiminari KAWAKAMI.	714
54	Progress of Blowing Conditions at the Single Nozzle Operation. (Study on lance nozzle at LD converter— I)	Tatsurō KUWABARA, et alii.	717
55	Progress of Operation Using Multiple-Hole Nozzle at Tsurumi LD Plant.	Yoshichika MIZUNO, et alii.	720
56	Effect of Lance Nozzle Condition and Charging Method of Fluxes as Coolant on Iron Content of Slag. (Study on iron content of slag of low carbon steel by LD process— I)	Masayuki HANMIYŌ, et alii.	722
57	Improvement of Refractories and Operation at Kukioka LD Converter Plant.	Kazuo WAKABAYASHI, et alii.	725
58	Erosion of Work Lining of LD Converter.	Toshio TAMAKI, et alii.	727
59	On the Means of Decreasing the Furnace Brick Consumption at Hirohata LD Converter.	Kazushi TSUCHIYA, et alii.	729
60	Influence of Various Factors on [Mn] during LD Process.	Takeomi KOBAYASHI, et alii.	732
61	On Sulphur Behavior in an Oxygen Converter in the Refining Process of Mild Steel.	Katukiyo MARUKAWA, et alii.	735
62	Use of Fe_2O_3 -added Lime in an LD Converter.	Kazuo WAKABAYASHI, et alii.	737
63	On the Influence of Mill Scale in Oxygen Converter Process.	Katsuma YOSHIDA, et alii.	740
64	Manufacturing of Large Carbon Steel Castings by LD Converter.	Seiji MASUMOTO, et alii.	743
65	Melting Carbon and Alloy Steel for Machine Structures in an LD Converter.	Yoshihiko MORI, et alii.	745
66	On the Operation with Low Hot Metal Ratio at Hirohata LD Plant.	Akiyoshi MINAMI, et alii.	748

-
- 67 Simulation on Production Capacity of
 Alternate 2-Unit Operation of 3 LD Converters
 at Kukioka LD Plant. *Shigeo MAEDA, et alii.* ...750
 68 The Study of Several Phenomena in LD Converter
 by Cold Models. *Kazuo SANO, et alius.* ...752
 69 The Selective Reduction and the Separation of Iron and
 Guangue Materials during Ni-Cr-Bearing Iron Ore
 Reduction at High Temperatures up to 1600°C.
 (Studies on reduction of Iron ore—II) *Fusatoshi EMOTO, et alii.* ...755
 70 On the Selective Grinding of Lateritic Iron Ore. *Kazuhiro MIIDA, et alius.* ...758

 71 On the Separation of Nickel by Ammonia Leaching
 Method for Laterite. (Studies on the utilization
 of laterite by fluidized bed reduction and ammonia
 leaching—I) *Yoshihisa HAMADA, et alii.* ...760
 72 On the Separation of Nickel by Inner Combustion
 Fluidized Bed for Laterite.
 (Studies on the utilization of laterite by fluidized
 bed reduction and Ammonia leaching—II) *Masakiyo MORIKAWA, et alii.* ...762
 73 Investigation of Nickel Leaching from Laterite Ores. *Yoshio SHIMOZATO, et alius.* ...764
 74 Fundamental Studies by Iron Oxide. (Effect of forma-
 tion of Na-ferrite in separation of chromium
 from laterite by soda-pellet-method—I) *Yoshinori SHIRANE, et alius.* ...767
 75 On the Method of Reduction Roasting of Iron Sand
 with Various Salts. (Study on the separation
 of titan in iron sand—III) *Ryōzō SATŌ.* ...770
 76 On the Rate of Deoxidation by Silicon.
 (Kinetic research of deoxidation of steel—I) *Takaho KAWAWA, et alii.* ...774
 77 On the Rate of Deoxidation by Aluminium.
 (Kinetic research of deoxidation of steel—II) *Takaho KAWAWA, et alii.* ...777
 78 On the Rate of Deoxidation by Manganese and
 Silicon Complex-Deoxidation.
 (Kinetic research of deoxidation of steel—IV) *Takaho KAWAWA, et alii.* ...780
 79 On the Rate of Deoxidation by Manganese and
 Aluminium Complex-Deoxidation.
 (Kinetic research of deoxidation of steel—V) *Takaho KAWAWA, et alii.* ...783
 80 On the Deoxidation with Titanium in Liquid Iron. *Hirotaka CHINO, et alii.* ...786

 81 Method for Determining Dissolved Oxygen after Addition
 of Manganese for Deoxidation. (Study on dissolved
 oxygen after addition of deoxidizer—I) *Yoshio MIYASHITA.* ...788
 82 Behavior of Dissolved Oxygen after Addition of
 Manganese for Deoxidation. (Study on dissolved
 oxygen after addition of deoxidizer—IV) *Yoshio MIYASHITA, et alii.* ...790
 83 Interactions between Solute Elements at Any
 Given Concentration in Homogeneous Multi-
 component Solutions. *Akira MOROOKA, et alius.* ...793
 84 Mathematical Model for Mass Transfer between
 Slag and Metal. *Dr. Kazumi MORI, et alius.* ...796
 85 Remelting of High Alloy Steels by the Electroslag Process. *Gorō YUASA, et alii.* ...799
 86 On Ingot Surface, Ingotsism and Melting Rate
 of Electroslag Remelted Ingots.
 (Studies on electroslag remelting, ESR—I) *Yoshihiro FUKUHARA, et alii.* ...802
 87 On Metal-Slag Reaction.
 (Studies on electroslag remelting, ESR—II) *Yoshihiro FUKUHARA, et alii.* ...805

- 88 Influence of Rimming Action upon Large Slag
Inclusions at Bottom of Rimming Steel Ingot. *Yukiyoshi ITOH, et alius.* ...807
- 89 Large Inclusions and Oxygen Contents in Molten Steel
before Tapping. (Study on the streak flow—IV) *Norikazu KURI, et alii.* ...810
- 90 Behavior of Dislocations in Matrix around Small
Inclusion. (Deformation of nonmetallic inclusions
in steel during rolling of stell—IV) *Masae SUMITA, et alius.* ...813
- 91 Preliminary Experiments on the Solidifying Rate and
Formation of Sulfide Inclusions in Resulfurized
Steels. (Studies on the solidification process and
structure of steel ingot—I) *Haruhiko HIRAI, et alii.* ...816
- 92 About the Formation Behaviors of Artificial Iron Chromite.
(Fundamental studies on the nonmetallic inclusions
in steels of the Fe-Cr-O system—V) *Nobuya IWAMOTO, et alii.* ...819
- 93 On the Method of Extracting Nonmetallic Inclusions in
18-8 Stainless Steel. (A study of nonmetallic
inclusions in 18-8 stainless steel—I) *Hikoya IWAI, et alii.* ...821
- 94 Preliminary Experiment on the Decision of the Oxygen
Content composing Nonmetallic Inclusions.
(Fundamental studies on the certainty about the
compositions of nonmetallic inclusions and micro-
phases in steels—I) *Nobuya IWAMOTO, et alii.* ...824
- 95 Studies on the Oxidation Reaction of Various Slags
Melted under Various Atmospheric Conditions. *Takehiro IWATA, et alii.* ...827
- 96 On the Activity of Iron Oxide in the Slags
MO-FeO-SiO₂ Systems. *Yasushi KOJIMA, et alius.* ...830
- 97 The Silica Reduction between CaO-SiO₂ and
Carbon-saturated Iron. *Toru TANIMURA, et alius.* ...833
- 98 Reducing Action of CaO-Al₂O₃ Slag upon the Molten Steel
and Its Effect on the Steel Quality. (On the role of
slags in melting of high grade steels—I) *Kōsi KATŌ.* ...835
- 99 Effect of Vanadium, Niobium, Titanium and Copper
on the Solubility of Hydrogen in Liquid Iron.
(The solubility of hydrogen in liquid iron alloys—II) ... *Shirō BAN-YA, et alii.* ...839
- 100 Effect of Heat Treatment in Quantovac Analysis
of Carbon Steel. *Kanetoshi NARAKI, et alii.* ...842
- 101 Determination of Sulphur in Steel by Coulometric
Titration Method. *Yūkō YAMADA, et alius.* ...845
- 102 Practical Experiments of High-Alumina Roof in
an Electric Arc Furnace. *Nobuo SUZUKI, et alii.* ...848
- 103 The Mechanism of Wear of Rammed Magnesia Bottom
in Electric Arc Furnaces and the Measures for
Preventing Wear. *Kōhei SHIMADA, et alii.* ...850
- 104 Study on Chemical Reactions between Liquid Steel
and Refractories. *Takami IKEDA, et alius.* ...852
- 105 Use of Zircon Brick in Ladle. *Yasuo ITŌ, et alii.* ...855
- 106 Hot Repaires for Furnaces by Nozzle Mix Method.
(Study on hot repairs for furnaces—I) *Noburō SHIMADA, et alius.* ...858
- 107 The Features of the Refractory Impregnated with
High Melting Oxide. *Takeshi HAYASHI, et alius.* ...860
- 108 The Rate of Dissolution of Commercial Silicon Nitride
Refractory by Liquid Iron. *Mineo KOSAKA, et alii.* ...863
- 109 Graphite Formation of Nodular Graphitic Steel. *Tetsuya MUKAI, et alius.* ...866

-
- 110 On the Desulphurization of Molten Pig Iron in the
12 Tons Shaking Ladle. (On the shaking ladle—II) ... *Jirō JIZAIMARU, et alii.* ...867
- 111 The Effect of Reduction Ratio on Mechanical
Properties of Steel Plates Produced by
Continuous Casting Billets. *Sadao YONEHARA, et alius.* ...870
- 112 Quality of Continuos Casting Stainless Slab. *Shigeo HORIO, et alii.* ...873
- 113 Effect of the Continuous Casting Conditions
on the Qualities of Continuously Cast Ingot
of High Carbon Cr Bearing Steel.
(Study on the continuous casting of steel—III) *Hisashi TAKADA, et alii.* ...876
- 114 Factorial Experiments of Melting Period in the
Open Hearth Furnace. (Standardization of
open hearth furnace practice—I) *Hitoshi YOSHII, et alii.* ...878
- 115 On Low Hot-metal Ratio Operation of Open
Hearth Furnaces at Chiba Works. *Kenzō ŌSUGI, et alii.* ...880
- 116 Behavior of Nitrogen in the Open Hearth Steelmaking. *Shinobu OKANO, et alii.* ...882
- 117 The Rate of Absorption of Nitrogen in Liquid Iron
Containing Oxygen and Sulfur. (Studies on the
rate of absorption of nitrogen in liquid iron—III) *Tatsuro CHŌ, et alius.* ...884
- 118 Application of Scrape Process to the Industrial
Steel Ingot. (Study on solidification of
steel ingot by scrape process—I) *Masaru HUKUMOTO, et alii.* ...886
- 119 Study on the Solidification Rate of Rimmed
Steel by Means of Radio Isotope. *Takahiko ADACHI, et alii.* ...889
- 120 Operation Control of Teeming Yard in Steelmaking Plant.
(System simulation of steelmaking plant—V) *Etsuo NISHIMURA, et alii.* ...891
- 121 Model Experiment on Top Pouring at Ingot Making. *Bunshō HIRACKA, et alii.* ...893
- 122 Quality of Big-End-Up Slab Ingot Compared
with Big-End-Down One. *Shigeyoshi KINUGASA, et alius.* ...895
- 123 Improvement of Cavity Included Killed Ingot. *Yasuteru YAMADA, et alii.* ...898
- 124 On the Upside Down Charging for Semi-killed
Ingots in Soaking Pits. *Kinya MOTODA, et alii.* ...900
- 125 Study on the Solidification and Segregation of Large
Steel Ingots for Forging. (On the solidification
of chilled parts of round ingots—I) *Tōru TODOROKI, et alii.* ...903
- 126 Some Considerations on Formation of String Ghost. *Tadayoshi TAKAHASHI, et alius.* ...905
- 127 The Effect of High Pressure on the Molten Steel
Concerning Segregation of the Steel Ingot. *Shōichi SHIKANO, et alius.* ...908
- 128 On the Properties of New Austenitic Hot Die Steel. *Masuo HAYASHI, et alii.* ...911
- 129 Study on Closing of Internal Cavities in Steel
Stock by Up-Setting. *Shōichi SHIKANO.* ...913
- 130 On the Metal Flow of Erhardt Piercing Process. *Mutsuo INOUE, et alii.* ...916
- 131 On the Irregular Wear of Work Roll Used for the
Early Stand of Hot Tandem Finishing train. *Hidemitsu TAKEUCHI, et alii.* ...918
- 132 Directional Properties on Hot Extruded Steel Plates. *Masaru UTAKŌJI, et alius.* ...921
- 133 A Study on Hot Workability of 13Cr Steel with Intermittent
Impact Torsion Test. *Yūzō ŌTAKARA, et alii.* ...923
- 134 On Measured Results of Rolling Power
in Rolling of Shapes. *Naohisa JYŌKEI, et alii.* ...925
- 135 On Theoretically Attainable Max. Stretch Coefficent
and Calculation of Roll r.p.m. in Stretch Reducing
Mill (Study on stretch reducing mill—I) *Norio MATSUKI, et alii.* ...928

-
- 136 Effect of Rolling Speed and Strip Width on the Mill Spring.
(On the mill spring in 4-high cold mill.— II) Ichirō KUNŌ, et alius. ...931
- 137 Effect of Residual Stresses on the Surface Hardness
of the Cold Strip Mill Rolls. (Study on the working
rolls of cold strip mills— III) Kiyozō SAKABE, et alii. ...932
- 138 Effect of the Fiber Structure Produced by Forging and
Ghost Spot on the Damages of Rolling Contact.
(On the damages due to rolling contact of back
up roll materials— III) Kōichi KUDŌ, et alii. ...935
- 139 On Decarburization during Heating-Up or
Cooling-Down. (Atmosphere control in
the batch type hardning furnace— IV) Shigeru MASUMOTO, et alius. ...937
- 140 Some Electronmicroscopic Observations of Dislocations
in Low Carbon Mild Steels under Tension.
(A study of fatigue properties in steels— I) Toshiaki HAZE, et alii. ...940
- 141 Some Electronmicroscopic Observations of Dislocations
in Low Carbon Mild Steels under Tensile Repeated
Stress. (A study of fatigue properties in
steels— II) Dr. Syōichi NAKANISHI, et alii. ...942
- 142 Effects of Grain Sizes and Deformation Rates on the
Tensile Properties of a Temper-Embrittled
Steel at Low temperatures. (Measurements
of tensile properties of steels with a high
speed impact tension testing machine— II) Dr. Tadahisa NAKAMURA, et alii. ...944
- 143 Study on the Structure of Cold-Drawn
High Carbon Steel. Eiji TAKAHASHI, et alii. ...946
- 144 On the Mechanical Properties of Thick Wall, Small
Low Carbon Chromium Molybdenum Steel Pipe. Katsuhiko SHIMADA, et alii. ...949
- 145 Cold Press Bending of Steel Tubes. Motoo YAGI, et alius. ...952
- 146 The Spheroidizing of Bearing Steel Tubes. Saburō SHIKŌ, et alii. ...954
- 147 Effect of Shape and Diameter of Shot and Time of
Peening. (Hardness, residual stress and fatigue
limit of shot-peened valve spring— I) Dr. Kōichi FURUSAWA, et alii. ...956
- 148 Effect of Annealing after Shot Peening and Shot-
speed etc. (Hardness, residual stress and fatigue
limit of shot-peened valve spring— II) Dr. Kōichi FURUSAWA, et alii. ...958
- 149 On the Spring Properties of Inconel X Type Alloy
under Repeated Cycle of Heating.
(Studies on super alloys for spring— VII) Kazunori KAMISHŌHARA, et alii. ...960
- 150 Continuous Magnetic Hardness Gage. Hiroyuki HARADA, et alii. ...962
- 151 Transformation of Iron Oxide.
(Study on iron oxide film— II) Kineo TAKAGI ...964
- 152 Wet Sand Erosive Wear Resistance of Steels. Tadashi KATOU, et alii. ...967
- 153 Relation between Nonmetallic Inclusion in Ball Bearing
Steel and Fatigue Life of Bearing Ball. (Study on
nonmetallic inclusion in ball bearing steel— II) Susumu NASU, et alii. ...969
- 154 On the Tempering Behavior of 1Cr, 1Cr-0·3V,
0·3Ni-1Cr-0·3Mo and 1Cr-0·3Mo-0·3V Steels.
(Study on hot work tool steels— VI) Tomitaka NISHIMURA, et alius. ...973
- 155 The Effect of Cooling Rate from the Quenching Temperature
and Two Step Austenizing Treatment on the Creep
Rupture Strength of 1Cr-1Mo-1/4V Steel. Ryōichi SASAKI. ...975
- 156 Effect of Ni on the Properties of Cr-Si-Al
Heat Resisting Steel. Kiyoshi FUJIWARA, et alius. ...977

- 157 Effect of Austenitizing Temperature on the Behavior in Transformation of Si-Cr-Mo Heat Resisting Steel. ... Kazuo NAKAZAWA, et alii. ...979
- 158 Effect of Boron Plus Nitrogen on the High Temperature Properties of the High Manganese Heat Resisting Alloys. Heitarō YOSHIDA, et alii. ...982
- 159 On the High-Temperature Strength and Structural Change of Type 304 Stainless Steel Castings. (Study on the austenite stainless steel castings—Ⅰ) Nobuhiro ŌKUBO, et alii. ...985
- 160 Creep Properties of Austenitic Stainless Steels for Super-Critical Boilers. Sadao OHTA, et alii. ...988
- 161 Effects of P.S.N. Sn and As on 18-4-1 Type High Speed Steel. Masayuki SUZUKI, et alius. ...990
- 162 Study on 15Cr-4Ni-Mo-Co-Nb PH Stainless Steel. (Studies on ST-154 PH steel— I) Dr. Shigeki SAWA, et alii. ...993
- 163 On the properties of 15Cr-4Ni-Mo-Co-Nb PH Stainless Steel. (Studies on ST-154 PH Steel— II) Dr. Shigeki SAWA, et alii. ...996
- 164 Effect of Carbon, Titanium and Boron on the 15Cr-12Ni Austenitic Heat Resisting Steel. (Studies on the weak precipitation hardening austenitic heat resisting steel— III) Hidekatsu KUKI, et alii. ...998
- 165 Effect of Bi, Sb and B on High Temperature Strength of 17Cr-12Ni-2Mo Steel. (Study on austenitic heat resisting steels— I) Humio HATAYA, et alus. ...1001
- 166 The Effect of Ti, Nb and W Contents on Creep Rupture Strength of 18Cr-12Ni Austenitic Heat Resisting Steels Containing 0.2% B. (Study on austenitic heat resisting steel— III) Yoshikuni KAWABE, et alii. ...1003
- 167 About the Precipitations and Structures of 18 Cr-12Ni Austenitic Steels Containing 0.2% B. (Study on austenitic heat resisting steel— IV) Yoshikuni KAWABE, et alii. ...1006
- 168 Effect of Heat Treatment and Alloying Elements on the Properties of 21-4N Valve Steel. Yoshimichi MATSUMOTO, et alii. ...1009
- 169 Effect of the Alloying Elements and Casting Conditions on the Creep Rupture Strength of 28 Chromium-15 Nickel Stainless Steels. (Studies on the heat resisting materials for ultra high temperature— II) Dr. Toshio FUJITA, et alius. ...1011
- 170 On the High Temperature Properties and the Corrusion Resistance of Centrifugally Casted Stainless Steels. Hiroo NAGANO, et alii. ...1014
- 171 On the Nickel Base Cr-Mo-Cu Acid Resisting Alloys. (Studies on acid resisting alloy steels— II) Toshio MORI, et alius. ...1017
- 172 The Effect of Free Cutting Additives on the Machinability of Heattreated Hot Work Die Steel. Yoshihiro YAMAGUCHI, et alii. ...1021
- 173 On the Impact Strength of 5% Cr Hot Work Die Steel. Satoshi WATANABE, et alius. ...1023
- 174 Contribution of Cementite to the Tempered Properties of 8% Chromium Die Steels, When Coexists with η -Carbide. (Study on the cold working tool steels containing 8% chromium— II) Michihiko SUZUKI, et alii. ...1026
- 175 Study on the Quenching Effect in Several Media and the Temperability of Spring Material Made of 9%W-Cr-V Steel, Mn-Cr Steel and Si-Mn Steel. (Study on the spring materials— III) Dr. Hideji HOTTAN. ...1029

- 176 Effect of Small Amount of Molybdenum, Nickel and Copper on Gas Carburizing Characteristics of 1% Cr Steel. *Hyōjirō KURABE, et alii.* ...1031
- 177 On the Dimensional Change of Cr-Mo and Ni-Cr-Mo Case Hardening steels (JIS-SCM 21 and SNCM 21) after High Temperature Carburizing. (Studies on the distortion of steels in high temperature carburizing—Ⅱ) *Yasuhiko NAKAMURA, et alii.* ...1034
- 178 On the Carburized and Melted Cr-Mo Steels. *Hirooki NAKAJIMA, et alius.* ...1037
- 179 Surface Character of Electrolytic Tin Plate and Corrosion Resistance. *Akio MIYACHI, et alii.* ...1040
- 180 Recovery of Zinc from Top-dross of Hot Dip Galvanizing. *Noboru KONDŌ, et alius.* ...1042
- 181 Coupon Test on Hydrogen Attack of Steels in "Hydroformer" Plant. *Dr. Masayoshi HASEGAWA, et alius.* ...1044
- 182 A Study on the Intercrystalline Corrosion Properties of Low Carbon Austenitic Stainless Steel. (Effect of chemical composition and heat treatment condition on corrosion-resisting properties in the several corrosion-testing methods—Ⅱ) *Hirofumi HAMADA, et alii.* ...1047
- 183 Fracture Characteristics of Stainless Clad Steels. (Study of composite materials—Ⅱ) *Shōhei FUJITSU.* ...1052
- 184 Effect of Heat Treatment on Stainless steel. (Study of Pitting Corrosion for stainless steel—Ⅱ) *Yutaka, ADACHI.* ...1054
- 185 Study on the Growth of Graphite Steel. *Shigeru TAKEUCHI, et alii.* ...1057
- 186 Hot Workability of High Carb on Cr-Mo Steels and Cr-Mo Cast Irons Made from High Purity Iron Sand Pig. (Properties of several kinds of iron and steels made from high purity iron sand pig—Ⅱ) *Kiyoshi MATSUKURA, et alii.* ...1059
- 187 Resistance to Fire Cracking of Various Cast Irons. (Properties of several kinds of iron and steels made from high purity iron sand pig—Ⅲ) *Yoshio BAN, et alius.* ...1062
- 188 Influence of Chemical Composition on Glasslining for Cast Iron. *Kōshi MIYAZAKI, et alii.* ...1064
- 189 Grain Growth of Fe-C Solid Solution. (Study on grain boundary of Fe-X bindry alloys—Ⅰ) *Haruki SHIRAISHI, et alii.* ...1067
- 190 Grain Boundaries Revealing of Quenched-Tempered Steels. *Hirosuke TABE, et alii.* ...1069
- 191 On the Machinability and Microstructure of Low Carbon Construction Steels Containing a Small Quantity of Ni and Cr. (Study on machinability and minor alloy elements in steels—Ⅱ) *Dr. Tōru ARAKI, et alii.* ...1071
- 192 Effect of Small Amount of Ni and Cr on Properties of Low Carbon Constructional Steels from Different Histories. (Studies on effects of Metallic impurities on properties of steel—Ⅲ) *Shirō YOSHIMATSU, et alii.* ...1075
- 193 Effect of Small Additions of V, Nb and Ta on the Mechanical Properties of Medium Carbon Steels. *Haruo KAJI, et alii.* ...1078
- 194 Study of Mo-B Hight Steel. (The relation of chemical composition to the strength of high strength steels in the normalized condition—Ⅰ) *Tatsuro KUNITAKE, et alii.* ...1080
- 195 Study of Low Alloy Hight Strength Steels. (The relation of chemical composition to the strength of high strength steels in the normalized condition—Ⅱ) *Takayasu OKADA, et alii.* ...1083

-
- 196 Measurement of the Diffusion Constant of Fe in
Some Liquid Non-Ferrous Metals. *Makoto KATŌ, et alii.* ...1085
- 197 Rate of Interface Reaction between Steel and Liquid Al. *Minio KOSAKA, et alius.* ...1089
- 198 The Role of Ca and Mg as a Deoxidizing Agent
in the Vacuum Melted Pure Iron. (Study of
pure iron—Ⅳ) *Toshikatsu ŌTANI, et alius.* ...1091
- 199 Hardening Effect of Uranium for Iron. *Dr. Tsuyoshi MASUMOTO, et alii.* ...1094
- 200 Effect of Heat Treatment on Ni-Al Age Hardening Steels..... *Masao KANAO, et alius.* ...1097
- 201 Control of Austenite Grain Size on the Hard
Steel Wire Rod. *Yasuhide ABE, et alii.* ...1100
- 202 Influence of Raw Materials on the Propertied of High
Carbon Steel Wire Rod. *Naoki EGUCHI, et alii.* ...1102