

Contents of the Technical Papers for the 68th Grand Lecture
Meeting of The Iron and Steel Institute of Japan.

C O N T E N T S

Lect. No.	Title	Lecturer
1	Sintering Pan Test of High Basicity Sinter. (Studies of high basicity sinter—I)	Yasumoto ŌTAKE. ...1559
2	Temperature Distribution and Permeability Change in Bed during Sintering. (Studies of high basicity sinter—II)	Yasumoto ŌTAKE. ...1561
3	Effect of Mineralogical Composition on the Strength and Reducibility of Sinter with Various Basicity. (Studies of high basicity sinter—III)	Yasumoto ŌTAKE, et alii. ...1563
4	Study of High Basicity Sinter with a Small Sintering Apparatus.....	Diezo SAKAMOTO et alii. ...1566
5	On the Production of High Basicity Sinter and It's Effect on Blast Furnace Operation.....	Junsaku KURIHARA, et alii. ...1567
6	Relation between the Basicity Ratio of Sinter and Its Characteristics.	Masahiro MAEKAWA, et alii. ...1571
7	Study on the Properties of Three Calcium Ferrites in the CaO-Fe ₂ O ₃ Binary System. (Study on the properties of self-fluxing sinter—I)	Minoru ASADA, et alii. ...1574
8	Effects of Sinter Properties on Blast Furnace Phenomena.....	Hiromi ASAI, et alii. ...1577
9	Effect of Adding Crushed Product of Magnetite Ore and Return Fines on Sintering Characteristics.....	Masahiro MAEKAWA, et alii. ...1579
10	Effect of Semi Pellet on Sintering Properties.	Toshio HIRAI, et alii. ...1582
11	On the Mixing Faculty of Drum Type Mixer for Sinter Plant.....	Ichirō KURASHIGE, et alii. ...1584
12	On the Automatic Control of Moisture Content in Sinter Raw Mixture.....	Ichirō KURASHIGE, et alii. ...1586
13	Automatic Control of Mix Moisture in Sinter Plant. (Application of neutron moisture meter—I)	Yasuto TAKASAKI, et alii. ...1588
14	Continuous Measurement of Moisture in Raw Materials for Blast Furnace. (Application of neutron moisture meter—II)	Tetsuo IZAWA, et alii. ...1590
15	Relation among Moisture Contents and Pre-Heating Temperature of Charge Coal and Characteristics of Coke...Tetsu NISHI, et alii. ...1592	
16	Effect of Ore Preparation on the Blast Furnace Performance.....	Yasuyoshi MIZUNO, et alii. ...1594
17	Effect of the Heavy Charge on Gas-Flow and Material Distribution in a Blast-Furnace Stack	Hideo KANOSHIMA, et alii. ...1596
18	High Top-Pressure Operation of Muroran No. 3 Blast Furnace.....	Mitsuru NOZAKI, et alii. ...1599
19	Investigation into the Inner Side of the Blast Furnace No. 1 at Tsurumi Works.....	Genji NAKATANI, et alii. ...1601
20	Consideration on Relations between Rate of Direct Reduction and Top Gas Ratio. (Studies on the improvement in blast furnace practice—V)	Fumio NAKAMURA, et alii. ...1604
21	A Study of Coke Rate Based on Solution Rate and Its Application to Blast Furnace Operation.....	Noritoshi INAGAKI, et alii. ...1607

- 22 The Control of Chemical Compositions on Smelting of Foundry Pig Iron in Blast Furnace. *Sekijun IZUMI, et alii.* ...1609
- 23 Multiple Correlation Analysis on Desulphurization in Blast Furnace..... *Norihiko SATŌ, et alii.* ...1611
- 24 Effect of Al_2O_3 Content in Blast-Furnace Slag on the Desulphurization. *Hiroshi NOMIYAMA, et alii.* ...1613
- 25 On the Properties of Ti-Bears Sampled from the Blast Furnace Hearth. *Bunji ETŌ, et alii.* ...1616
- 26 On the Relation between Distribution of Charge in Blast Furnace and Pig Iron from Cinder Notch at Slagging. *Toshitaka TSUTSUMI, et alias.* ...1619
- 27 Viscosity and Fluidity of High-Alumina Bosh Slag. *Katsuya ONO, et alii.* ...1621
- 28 On Blowing-In of Blast Furnace after Castable Gunning.... *Haruo MORITA, et alii.* ...1623
- 29 Measurements of the Change of Porosity and Pore Distribution of Iron Oxides during Reduction with CO Gas. (Studies on the reduction of iron oxides—II). *Masanori TOKUDA, et alias.* ...1626
- 30 The Formation of Iron Shell and HOLLOWNESS during Iron Ore Reduction at High Temperature. (Studies on reduction of iron ores—I)..... *Fusatoshi EMOTO, et alii.* ...1629
- 31 Reduction of Iron Ores by Carbon Monoxide at Lower Temperatures..... *Isamu TAGUCHI, et alii.* ...1631
- 32 Studies on the Carbon Deposition of Metallic Iron Reduced. (Reduction of iron oxide by the mixed gas of CO and H_2 —IV)..... *Jirō HIRAO.* ...1634
- 33 The Reduction of Iron Ore in Rotary Bed..... *Tanekazu SŌMA.* ...1636
- 34 On the Improvement upon the Reduction by Rotary Kiln. (Study on the pre-reduction of iron sand with a rotary kiln—VII)..... *Hideo ARAKAWA, et alias.* ...1639
- 35 Study on the Phase Diagrams of the Lime-Titania-Silica-Alumina System..... *Atsumi ŌNO, et alias.* ...1641
- 36 Fluidized-Bed Reduction of Iron Sand by Hydrogen Gas. *Shin-ichirō AOYAMA, et alii.* ...1643
- 37 Reduction of Fine Iron Oxide by Hydrogen. (On the manufacture of iron powder from iron oxide by gas reduction at low temperature—V)..... *Teiji TERAMINE, et alii.* ...1646
- 38 On the Passivation of the Active Iron Powder..... *Kaname WADA, et alii.* ...1648
- 39 Separation of Chromium from Lateritic Iron Ores..... *Toshiharu SHUDŌ, et alias.* ...1651
- 40 Mineral Components of the Sulphidizing and Reducing Roasted Nickel Containing Iron Ore. *Susumu SAKAI, et alias.* ...1653
- 41 Magnetic Separation of Nickel from Nickel Containing Iron Ore, Treated by Sulphidizing and Reducing Roasting. *Susumu SAKAI, et alias.* ...1656
- 42 On Selective Chlorination of the Iron Ores Containing Chromium and Nickel..... *Ryūichi ISHIZUKA, et alias.* ...1659
- 43 On Degradation of Sinter during Chemical Reduction..... *Takehiro HORIO, et alii.* ...1662
- 44 Magnetite in Sinters..... *Mayumi YOSHINAGA, et alias.* ...1664
- 45 Effect of Firing Condition on Qualities of Metallized Briquettes. (Studies on production of metallized briquettes from magnetic iron sand—I) *Hiroshi KATAYAMA, et alias.* ...1667
- 46 Effect of Various Kinds and Particle Sizes of Raw-Material on Qualities of Metallized Briquettes. (Studies on production of metallized briquettes from magnetic iron sand—II)..... *Akihiko TANAKA, et alias.* ...1669

- 47 Hot Compression Strength of Ore, Sinter and Pellet.
 (Studies on the properties of blast furnace burdens
 under the hight temperatuse conditions—I) *Matoka DOSODEN, et alii.* ...1672
- 48 Manufacture of High Reduced Briquettes from Fine
 Iron Ore..... *Hiroshi Jō, et alias.* ...1673
- 49 Effect of Pressure on the Recrystallization of Powdered
 Iron Ores. (Investigation into recrystallization of
 powdered iron ores—II) *Taizō NAKATA, et alii.* ...1676
- 50 Study on the Treatment of Open Hearth Furnace Dust by
 Rotary Kiln Process..... *Takeji OGASAWARA, et alii.* ...1677
- 51 Study on the Suitable Length of Main Runner of Blast
 Furnace..... *Yoshio OKUNO, et alii.* ...1680
- 52 On the Theoretical Equation of the Coke Equivalent of Injected
 Fuel and Its Application..... *Kichiya SUZUKI, et alii.* ...1682
- 53 On the Supplementary Experiments of Powder-Coal
 Injection into 1-t Blast Furnace..... *Cheoul Woo KIM, et alii.* ...1685
- 54 A Method of Calculation of an Oil per Coke Replacement
 in Blast Furnace Practice..... *Nobuo TSUCHIYA, et alii.* ...1690
- 55 On the Clean Fe-Si Alloy..... *Sumio IZUMI, et alii.* ...1693
- 56 Conditions of Spheroidal Graphite Formation in Cast
 Iron..... *Masuteru MARUYAMA, et alii.* ...1695
- 57 Analog Simulator for the Analysis of the Steel Ingot
 Solidification Process in the Continuous Casting
 Plant. (Study on the continuous casting—I)..... *Toshiya MORISUE, et alii.* ...1697
- 58 Analysis of the Steel Ingot Solidification Process in the
 Continuous Casting Plant by Means of the Analog
 Lator. (Study on the continuous casting—II)..... *Tadashi KAWAGUCHI, et alii.* ...1700
- 59 On the Continuous Casting Conditions and the Qualities
 of Continuous Cast Ingot of Austenitic Stainless Steel.
 (Study on continuous casting of steel—II)..... *Takeshi SUZUKI, et alii.* ...1702
- 60 Improvement in Mixer Life in LD Plant at Hirohata
 Works..... *Kazushi TSUCHIYA, et alii.* ...1705
- 61 Operation of Dead Mixer at Tobata LD Plant..... *Takekazu YAMAGUCHI, et alii.* ...1707
- 62 On the Operation and Repair Process of a 1,300t
 Hot Metal Mixer..... *Seizō HAYASHI, et alii.* ...1709
- 63 On the Basis of Producing Alloy Steels by Oxygen Converter.
 (On the production of alloy steels by oxygen
 converter—I)..... *Kiminari KAWAKAMI, et alias.* ...1712
- 64 On the Melting Practice of Alloy Steels by Oxygen Converter.
 (On the production of alloy steels by oxygen
 converter—II)..... *Kiminari KAWAKAMI, et alias.* ...1715
- 65 On the Properties of Alloy Steels by Oxygen Converter.
 (On the production of alloy steels by oxygen
 converter—III)..... *Hirohiko NOZAKI, et alias.* ...1718
- 66 On the Melting Practice of High Grade Killed Steels by
 Oxygen Converter. (On the production of alloy steels
 by oxygen converter—IV)..... *Narito KIMURA, et alii.* ...1720
- 67 Continuous Measurement of Temperature for Bath of LD
 Converter..... *Seiji KOBAYASHI, et alii.* ...1723
- 68 Changes of Metal Composition and Temperature during
 Tapping in the LD Process. *Hisashi MATSUNAGA, et alii.* ...1725
- 69 On the Control of Oxygen Consumption in LD Converter.
 (Study on the end point control of a LD converter—II)
 *Osamu TSUBAKIHARA, et alii.* ...1727
- 70 Use of Iron Sand in LD Converter..... *Seizō HAYASI, et alii.* ...1730

- 71 Operational Results Using Multiple-Hole- Nozzle at Tobata No. 1 LD Plant *Masazumi ANDŌ, et alii.* ...1733
- 72 Formation of Iron Oxide Fume or Fog and Rate of Decarburization in Oxygen Blowing. (On the iron oxide fume or fog formation in decarbrization processes— I)..... *Mineo KOSAKA, et alius.* ...1735
- 73 A Consideration on Decarburization in the Oxygen Converter of Unburned Gas Recovery System..... *Taiji ARAKI, et alius.* ...1738
- 74 Intermittent Operation Using Two of the Two Converters at Tobata No. 2 LD Plant..... *Hachiro ARAKI, et alii.* ...1740
- 75 Construction and Operation of the LD Converter Plant at Tsurumi Iron Works..... *Takayuki KOYANO, et alii.* ...1742
- 76 On the Characteristics of the Equipment of Computer Control System for LD Converter of Amagasaki Iron & Steel Works...*Masateru HAYASHI, et alii.* ...1744
- 77 On Changes of Ladle Slag Compositions in the Course of Pouring..... *Tomoyasu OGAWA, et alii.* ...1747
- 78 On the Influence of Casting Rate on the Temperature Difference between Steel Bath in Ladle and Casting Stream. (Studies on the pouring temperature of steel— II)..... *Noboru HIRAOKA, et alius.* ...1750
- 79 Change in Temperature of Molten Steel and Mould during and after Casting. *Genichi USUI, et alii.* ...1751
- 80 Metal Movement during Solidification of Rimmed Steel Ingot. (Tracer application of RI to steel works— V)..... *Midori MATSUO, et alii.* ...1754
- 81 Study on Factors for Thickness of Rim Zone. (Study on the large capped steel slab ingots by bottom pouring— I) *Akira FURUYAMA, et alii.* ...1756
- 82 On the Relation between Seamy Defects of Capped Steel Products and Steelmaking Proces *Mitsuo KANDA, et alii.* ...1758
- 83 On the Manufacturing of Semi-Killed Steel Plate..... *Motoji ŌTA, et alii.* ...1761
- 84 Arc Heating of Ingot Feeder Heads..... *Norio ISIKAWA, et alii.* ...1763
- 85 Study on 4 Slab Type Exothermic Hot Top..... *Tōru SAITO, et alii.* ...1765
- 86 Effect of the Moving Electromagnetic Field on the Inverse-Vsegregation of Steel Ingot. (Studies on the inverse-vsegregation of steel ingot— IV) *Noboru HIRAOKA, et alii.* ...1768
- 87 Internal Structure of 20-t Heavy Steel Ingot Made by Basic Electric Arc Furnace and Acid Open Hearth Furnace as well as That of 20-t Steel Ingot Made by Vacuum Casting. (Study on specifications of heavy steel forgings made by basic electric arc furnace and acid open hearth furnace as well as investigations on vacuum casting— II)..... *Gorō SUGANO, et alii.* ...1770
- 88 Measurement of Circulation Rate of Molten Steel and Mixing in Ladle in R-H Vacuum Degassing Process..... *Etsuo NOMURA, et alii.* ...1773
- 89 The Manufacture of the Boiler Plate by the D-H Process. (On the D-H vacuum degassing process— I)..... *Kamematsu MATSUDA, et alii.* ...1775
- 90 Effect of Induction Stirring on the Homogenization of Ferroalloy in Electric Furnace. (Tracer application of RI to steel works— VII)..... *Yasushige UCHIDA, et alii.* ...1777
- 91 The Synthetic Slag Treatments on Ball Bearing Steel. *Masatsune YOSHIMURA, et alii.* ...1780
- 92 On the Diffusion Deoxidation in Reducing Period of the Basic Electric Arc Furnace..... *Sadao HARA, et alii.* ...1782
- 93 Study on the Capacity of Scrap Yard by Unit Charge System. (System simulation of steelmaking plants— IV)....*Kazuya KUDŌ, et alii.* ...1784

- 94 Sulfur Behavior in the Basic Open Hearth Furnace..... *Hitoshi YOSHII, et alii.* ...1786
- 95 On a Formulation of factors in Open Hearth Furnace for
Computers..... *Etsuo NISHIMURA, et alii.* ...1788
- 96 The Study of the Design of Open Hearth Furnace and
Steel Production Rate..... *Dr. Iichi TAJIRI, et alii.* ...1790
- 97 Influence of Bottom Making Conditions on Properties of
Magnesia Rammed Hearth. (Study on magnesia
rammed hearth for open hearth furnaces— I) *Kōhei SHIMADA, et alii.* ...1793
- 98 A New Shaking Ladle. (On the shaking ladle— I)..... *Rinnosuke YAGURA, et alii.* ...1795
- 99 On the Desulfurization of Hot Metal in the Shaking Ladle.
..... *Yasushi KUROIWA, et alii.* ...1797
- 100 On the Measurement of Erosion of Ladle Bricks by
Means of Radio Isotope..... *Hisashi ISSHIKI, et alii.* ...1799
- 101 Study of the Unburnt SiC Brick on Ladle..... *Takayasu NIIMI, et alii.* ...1801
- 102 Performances and Reconstructions of 200-t März-Bögens
Open Hearth Furuaces..... *Hiroshi WADAGUCHI, et alii.* ...1804
- 103 The Mechanism of Blow Hole Generation at High Carbon
Steels and the Preventive Method against Blow Holes.
(Studies on the Cons-el arc melting of steels— IV) *Yoshihiro FUKUHARA, et alii.* ...1807
- 104 Evaporating Rate of Molten Iron Alloys, Reactions
between Those and Crucible Material under Reduced
Pressure. (Fundamental study on the vacuum melting—
II)..... *Yoshirō KATASE, et alii.* ...1809
- 105 Effect of Ti, Zr on the Deoxidation of Pure Iron
(Study of pure iron— IV)..... *Toshikatsu ÖTANI, et alius.* ...1812
- 106 Small Ingot Making of Pure Iron. (Study of pure
iron— V) *Toshikatsu ÖTANI, et alius.* ...1815
- 107 On the Measurement of the Oxidation or Reduction
Rate of Pure Iron or Iron Oxides. (Study on the oxygen
concentration cells at high temperature— V)..... *Dr. Kazuhiko GOTŌ, et alius.* ...1818
- 108 On Oxygen Pressure in Liquid Iron. (Study on the oxygen
concentration cells at high temperature— VI) *Dr. Kazuhiko GOTŌ, et alius.* ...1821
- 109 Determination of Oxygen Dissolved in the Fe-C-O Melts
by Electromotiveforce Measurement. (A study on
the rapid determination of oxygen dissolved in molten
steel by electromotiveforce measurement— II)..... *Hirobumi INOUE, et alii.* ...1823
- 110 Effects of Contacting Methods on the Extent of Reaction
in Heterogeneous Fluid-Fluid Systems..... *Dr. Kazumi MORI,* ...1826
- 111 Decarburizing Rate of the Molten High-Carbon Fe-C Alloys
by A-O₂ Gas Mixtures. (Kinetics of the oxidation of
molten iron alloys— I)..... *Yoshirō KATASE, et alii.* ...1828
- 112 Theoretical Consideration of the Furnace Deoxidation with
Aluminium. (Studies on the furnace deoxidation— I)..... *Akira MASUI, et alii.* ...1831
- 113 Equilibrium between Silicon and Oxygen. (Equilibrium
between molten iron and the slag FeO-MnO-CrO_x-SiO₂
saturated with silica— I)..... *Yasushi KOJIMA, et alius.* ...1834
- 114 On the Activity of Iron Oxide. (Equilibrium between molten
iron and the slag FeO-MnO-CrO_x-SiO₂ saturated with
silica— II) *Yasushi KPJIMA, et alius.* ...1836
- 115 Measurement of Interfacial Tension between Molten Metal
and CaO-SiO₂ Slags. (Fundamental study on interfacial
phenomena in iron- and steel-making processes— II) ... *Kazumi OGINO, et alii.* ...1838
- 116 The Effect of the Teeming in the Protective Atmosphere
on the Origin of Sand Seams..... *Hideyo HORI, et alii.* ...1841

- 117 On Origin of Macroscopic Nonmetallic Inclusions in Heavy Steel Ingot..... *Akitsu TOMITA, et alii.* ...1843
- 118 Study on Nonmetallic Inclusions in Steel with Cr₂O₃ Tracer..... *Yutaka WANO, et alius.* ...1845
- 119 Nonmetallic Inclusions of Rimmed Steel Ingot Originated in Ingot Scum. (Tracer application of RI to steel works—Ⅶ)..... *Hisashi MORI, et alii.* ...1848
- 120 On the Function of Sand Seam Distribution. (Studies on sand seam in low carbon killed steel—V)..... *Akira MASUI, et alii.* ...1851
- 121 Study on the Formation of Sulphide Networks at the Center Zone of Low C-Cr-Mo Steel Ingots..... *Tōru TODOROKI, et alii.* ...1854
- 122 On the Irreversible Phenomena of the Plate-Like Sulfide Inclusion. (The plate-like sulfide inclusion in Steel—Ⅱ).... *Dr. Kaichi MATSUBARA.* ...1857
- 123 On the Primary Inclusions of Silicon and Al Deoxidation. (Kinetic research on deoxidation of steel—I)..... *Takaho KAWAWA, et alii.* ...1859
- 124 On the Condition of Formation of Hercynite from Iron Oxide and Alumina..... *Mamoru YAMADA, et alius.* ...1862
- 125 About the Polymorphism of Alumina Formed in Steels by Aluminium Deoxidation. (Studies of deoxidation products—I)..... *Nobuya IWAMOTO, et alii.* ...1864
- 126 The Effect of Used Addition (Metallic chromium or ferr-chromium) on the Inclusions. (Fundamental studies on the nonmetallic inclusions in steels of the Fe-Cr-O system—Ⅱ)..... *Nobuya IWAMOTO, et alii.* ...1866
- 127 About the Applicability of Various Isolating Methods to the Chromium Containing Oxide Inclusions. (Fundamental studies on the nonmetallic inclusions of the Fe-Cr-O system—Ⅳ)..... *Shōji SHIJIMA, et alii.* ...1869
- 128 Behavior of Inclusions in Steels deoxidized with Silicon and Silicomanganese. (Deformation of nonmetallic inclusions in steel during rolling of steel—Ⅱ)..... *Masae SUMITA, et alius.* ...1870
- 129 Identification of Nonmetallic Inclusion in Ball Bearing Steel. (Study on nonmetallic inclusion in ball bearing steel—I)..... *Takeshi SASAKI, et alii.* ...1873
- 130 Quantitative Analysis of Nonmetallic Inclusion of Steel by the Electron Probe Microanalyser. *Iwao SAWAI, et alii.* ...1877
- 131 The Quantitative Analysis of Metallic Samples by X-Ray Microanalyser and Its Application. *Kō MIYAMURA, et alii.* ...1880
- 132 Sand Abrasive Wear..... *Kazuyoshi SATSUMABAYASHI, et alius.* ...1935
- 133 Effect of Cr and Mo on Properties of Abrasion Resisting Cr-Mo-V Cast Iron. *Kōsuke MURAI, et alii.* ...1937
- 134 On the Tempering Behavior of 5Cr-5W and 5Cr-5Mo Steels. (Study on hot work tool steels—V) *Tomitaka NISHIMURA, et alius.* ...1939
- 135 Study on the Fire Cracks of 5%Cr-1¹/4%Mo-1%V Steel. *Masatoshi MIURA, et alii.* ...1941
- 136 Contribution of Cementite to the 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.* ...1943
- 137 Study on High-C, High-V Mo High Speed Steels..... *Takeshi ITO, et alii.* ...1946
- 138 Effect of Heat Treatment and Working Degree on Transitions Temperature of 0.3% Carbon Steel. (Studies on transitions temperature for forging carbon steels—I)..... *Dr. Hiroshi YOSHIDA, et alius.* ...1948

- 139 A Consideration on the Temperature Dependence of Critical Stress for Brittle Fracture Propagation...*Masamichi TAKAHASHI, et alius.* ...1950
- 140 Neutron Irradiation Embrittlement of Reactor Structural Steels.*Tadato FUJIMURA, et alii.* ...1952
- 141 Low Temperature Impact Tests of Various Cast Steels.....*Isamu SHINODA, et alii.* ...1955
- 142 On the Behaviors of Retained Austenite of Ferritic Nickel Steels.....*Mitsutane FUJITA, et alius.* ...1957
- 143 Study on Stres Corrosion Cracking of Steel Tubes.....*Nobuyuki KAWAUCHI, et alii.* ...1959
- 144 Behavior of Stainless Steel and Other Corrosion Resisting Alloys in Hot and High Pressure Ammonia Atmospheres. (Study on high temperature gas corrosion on stainless and super alloy—I).....*Rikio NEMOTO, et alii.* ...1963
- 145 Some Effects of Nitrogen on Hight Temperature Strength of Low Carbon Steels.....*Takayasu OKADA, et alii.* ...1965
- 146 The Creep Rupture Strength of 2¹/₄Cr-1Mo Steel.....*Wataru KOJIMA, et alii.* ...1968
- 147 Production of Cr-Si-Al Heat Resisting Steel Tubes and Their Properties.....*Kiyoshi FUJIWARA, et alii.* ...1970
- 148 The Effect of C and Cr on the Damping-Capacity of 12%Cr Steel.....*Ryoichi SASAKI.* ...1973
- 149 A Study of σ -Phase in Duplex 25Cr-4Ni-1.5Mo Steel.*Norihsa HARANO, et alii.* ...1975
- 150 On the Nature of δ -Ferrite in 18-8 Stainless Steels.....*Susumu TAKEMURA, et alii.* ...1977
- 151 Effect of Nitrogen on the High Temperature Properties of the High Manganese Heat Resisting Alloys.....*Heitarō YOSHIDA, et alii.* ...1979
- 152 Study on Mn-Cr-Ni Modified Heat Resisting Steel.....*Eijirō ISHIKAWA, et alii.* ...1982
- 153 The Effect of Composition on the Creep Rupture Properties of Cr-Ni Austenitic Cast Steels.....*Fumio HATAYA, et alius.* ...1985
- 154 The Structure Change of Cr-Ni Austenitic Cast Steels by Creep Rupture Testing.*Fumio HATAYA, et alius.* ...1987
- 155 Effect of Copper and Boron on the 15Cr-12Ni Austenitic Heat Resisting Steel (Studies on the weak precipitation hardening austenitic heat resisting steel—I).....*Hidekatsu KUKI, et alius.* ...1990
- 156 Effects of Titanium and Carbon on the 15Cr-12Ni Austenitic Heat Resisting Steel. (Studies on the weak precipitation hardening austenitic heat resisting steel—II).....*Hidekatsu KUKI, et alius.* ...1992
- 157 Effect of C on the Properties of 25Cr-20Ni Heat Resisting Steels. (Studies on 25Cr-20Ni heat resisting steels—I)*Yōsuke MATSUMOTO, et alii.* ...1995
- 158 On the Spring Propeties of Inconel X type Alloy at High Temperature. (Studies on super alloys for spring—Ⅵ)...*Yosiaki KANAI, et alius.* ...1998
- 159 Effect of Carbon Content and Heat Treatment on Elevated Temperature Properties of Udimet 500. (Study on the Ni-base heat-resisting alloys—Ⅱ)*Kanō KIKUCHI, et alii.* ...2001
- 160 Titanium-Carbide, -Nitride and Carbonitride in Steel...*Masaharu TOKIZANE, et alii.* ...2004
- 161 Study on the Behavior of Aluminium Nitride in the Steel...*Haruo SHIMADA, et alii.* ...2006
- 162 The Influence of Heat Treatment on the Composition of Sulfide Inclusions in Steel.*Norio KASAMATSU, et alius.* ...2008
- 163 Effect of Lanthanum on Steel. (Study on special elements in steel—V).....*Atsushi MIYAMOTO, et alii.* ...2011
- 164 Effect of Nb and V on the Mechanical Properties of Plain Carbon Steels.....*Haruo KAJI, et alii.* ...2014
- 165 Study on Low Carbon Weldable High Strength Steels Containing Nb.....*Masao KANAO, et alius.* ...2017

- 166 On the Machinability of Low Carbon Construction Steels
Containing a Small Quantity of Nickel and Chromium....*Dr. Tōru Araki, et alius.* ...2019
- 167 Effect of Lead on the Quench-Ageing, Stress-Ageing and
Grain Size Characteristics of Low Carbon Steels..... *Akira KOYANAGI, et alius.* ...2022
- 168 On the Mechanical Properties and Heat-Treating Behavior
of Niobium-Bearing Rapid Nitriding Steel. (Study of
rapid nitriding steel— I) *Hiroshi SASAKI, et alii.* ...2025
- 169 Abnormality in Yield Property of Cr-Steels during Tempering.
(Studies on abnormality in yield property of steels during
tempering— I)..... *Ryūichi CHIBA, et alii.* ...2028
- 170 Cementite Grain Size and Rolling Fatigue of Bearing
Steel..... *Masumi ŌSAWA, et alius.* ...2030
- 171 On the Effect of Metallurgical Factors on the Hot Torsion
Characteristics of Carbon Killed Steel..... *Ikuo MAKABE, et alius.* ...2032
- 172 Relation between the Structures and Cold Drawabilities of
High Carbon Commercial Steel Rods..... *Jirō TOMINAGA, et alii.* ...2034
- 173 On the Properties of High Carbon Cr-Mo Steels Made from
High Purity Iron Sand Pig. (Properties of several kinds
of iron and steels made from high purity iron sand
pig— I)..... *Kiyoshi MATSUKURA, et alius.* ...2037
- 174 Studies on Surface Defects by Means of Artificial
Blowholes..... *Kōji ISHIWARA, et alius.* ...2039
- 175 Deformation and Closing of Internal Cavities in Ingot by
Solid Forging. (Study on forging of ingot— II)..... *Yasusiro HAYASI, et alii.* ...2042
- 176 Effect of Die Shape on the Metalflow in Hot
Extrusion of Steels *Sadao NAKAMURA, et alius.* ...2044
- 177 On the Necessary Pressure and the Flow of the Metal in
Hot Expansion Process..... *Masaru UTAKŌJI, et alius.* ...2046
- 178 Impact Extrusion of Steels..... *Tomoo KUMABE, et alii.* ...2048
- 179 On Measured Results of Rolling Torque in Stretch Reducing
Mill..... *Norio MATSUKI, et alii.* ...2050
- 180 On the Mill Spring in 4-High Cold Mill..... *Kazunaga MISONO, et alius.* ...2053
- 181 An Automatic Gauge Control for Tandem Cold Strip Mills.
..... *Kazunari HOSOKI, et alius.* ...2056
- 182 On the Electric Edge Position Control System..... *Akira ABE, et alii.* ...2057
- 183 New 3-High Roll Type Rolling Contact Testing Machine.
(On the damages due to rolling contact of backup
roll materials— I) *Kōichi KUDO, et alii.* ...2059
- 184 Effects of the Hardness of Materials on the Damages of
Rolling Contact. (On the demages due to rolling
contact of backup roll meterials— II) *Kōichi KUDO, et alii.* ...2061
- 185 Some Problems on the Residual Stress Measuring of
Large Materials. (Study on the working rolls of
cold strip mills— I)..... *Kiyozō SAKABE, et alii.* ...2063
- 186 Effect of the Residual Stress on the Premature Failure of
Cold Strip Mill Rolls. (Study on the working rolls of
cold strip mills— II)..... *Kiyozō SAKABE, et alii.* ...2066
- 187 On the Forging Effect for the Fatigue Strength of Large
Forgings. (Fundamental study of large forging— II)..... *Etsurō FUKUDA, et alii.* ...2069
- 188 Equipments and Operation of a Mill for the Hot-Finished of Electric
Resistance-Weld Small Diameter Pipes. *Tadashi MIYAHARA, et alii.* ...2071
- 189 On the Pickling of Mill Scale in Hot Strip Coils..... *Osamu MIKUNI, et alii.* ...2074

- 190 Influence of Demagnetization on the Cleaning Effect of Steel
Strips Junichirō YOURA, et alius. ...2076
- 191 The Corrosion Resistance of Hi-Top to Chemicals Tsuneo INUI, et alii. ...2078
- 192 Spot Welding and Seam Welding of Electrolytic Galvanizing
Steel Sheet Takeshi NISHIMURA, et alius. ...2080
- 193 On the Diffusion and Solubility Fe in Liquid Zn Makoto KATŌ, et alius. ...2083
- 194 Effects of Solid Diffusion on the Fe-Sn Alloy Layer of
Electrolytic Tin-Plate Kikuo MATSUSAKA, et alii. ...2086
- 195 On the Denitriding by the Aluminium Diffusion Treatment
of the Low Carbon Steel Sheet Dr. Etsurō SHŪTO, et alius. ...2088
- 196 The Effect of Oxygen Content on the Quality of Cold Rolled Low
Carbon Rimmed Steel Sheet Kiyoyuki IGARASHI, et alii. ...2091
- 197 Effect of Two-Stage Cold-Rolled Process on the Drawability
of Low Carbon Rimmed Steel Sheets Satoshi MORISHITA, et alii. ...2093
- 198 The Effect of Heating Rates on the Recrystallization
Behavior of the Cold Railed Steel Sheet. (The study
of heating rates on the press-formability of the cold
rolled steel sheet— I) Nobuyuki TAKAHASHI, et alii. ...2094
- 199 The Effect of Heating Rates on the Mechanical Properties
of the Cold-Rolled Sheet Steel. (The study of heating
rates on the press-formability of the cold-rolled steel
sheets— II) Yasuo SHINAGAWA, et alii. ...2097
- 200 On the Practical Annealing Cycles of Continuous Annealing
Furnace Narumi ANDŌ, et alius. ...2099
- 201 Influence of Mechanical Properties of Steel Sheet on the
Shapability in Press Forming Kōe NAKAJIMA, et alius. ...2102
- 202 Erichsen Test with the Thin Composite Steel Plate and
the Thin Plate of Mild Steel. (Study of composite
materials—I) Shōhei FUJITSU. ...2104
- 203 Direct Observation of Dislocations in Pure Iron Dr. Naohiro IGATA, et alius. ...2107
- 204 Determination of Oxide Inclusions in High-C, Cr Steel with
Alcoholic Iodine Method Asaji HOSOI, et alii. ...2109
- 205 Determination of Oxide in Ferro-Silicon Kiyoshi KANNO, et alii. ...2111
- 206 Study on the Isolation of Vanadium Carbonitride from the
Steel Haruo SHIMADA, et alii. ...2114
- 207 Determination of Zinc in Iron Ore and Dust by
Chelatometric Titration Method Dr. Shigeo WAKAMATSU. ...2117
- 208 Determination of Molybdenum in Stainless Steel and
Heat Resisting Alloy by the A.C. Polarographic
Method Takahiko MAEKITA, et alii. ...2119
- 209 On the Flame Photometric Determination of Lime in
Sintered Ore Yōzō TAKANO, et alius. ...2122
- 210 Rapid Determination of Hydrogen in Steel in Steelmaking
Process Hiroshi NAGAYAMA, et alii. ...2123
- 211 Inert Gas Fusion-Coulometric Determination of Oxygen
in Iron and Steel Dr. Shigero IKEDA, et alii. ...2126
- 212 Determination of Oxygen in High Sulphur Steels. (Studies
on the analysis of gases in steels by the vacuum
fusion method— II) Masataka KAMAKURA, et alius. ...2128
- 213 Determination of Oxygen in Fe-Si Alloy Terumoto SUGIUCHI, et alii. ...2132
- 214 Emission Spectrochemical Analysis of Mo High Speed
Steel. (Spectrochemical analysis of iron and steel
by direct reader— II) Fumio SAWAI, et alii. ...2134

-
- 215 Spectrographic Determination of Magnesium in Ductile
Cast Iron by Spark Discharge in Argon-Gas
Atmosphere..... *Kyōji, NISHIZAKI, et alii.* ...2136
- 216 Spectrographic Analysis of BF Slag by Solution
Method..... *Tatsuo HANADA, et alius.* ...2139