

Transport Phenomena and Modeling of the Ironmaking Processes

Contents

Transport Phenomena and Modeling of the Ironmaking Processes [Foreword]	T. SHIBUYA...955
Essay on Blast Furnace Technology [Letter]	M. TATEOKA...957
Iron Ore Deposits and Future Properties of Iron Ore Products	
in Western Australia [Commentary]	Y. HIDA and N. NOSAKA...960
Prospect of Cokemaking Technology in Next Generation [Commentary]	Y. TAKIZAWA...969
New Coal Policy Related with the Global Environmental Problem [Commentary]	H. NEL...977
Reaction Kinetics	
Influence of CO Ratio and Reduction Temperature upon the Reducibility of Calcium Ferrite in Sinter in the Initial Stage of Reduction with CO-CO ₂ -N ₂ Gas Mixture [Paper]	T. USUI, H. KAWABATA, T. FUJIMORI, I. FUKUDA and Z. MORITA...982
Effectiveness Factor of Porous Reduced Iron Pellets in Water Gas Shift Reaction [Paper]	F. SHEN, R. TAKAHASHI and J. YAGI...990
Effect of Water Gas Shift Reaction on the Reduction of Wustite Pellets in a Fixed Bed with H ₂ -CO and H ₂ -CO ₂ Gas Mixtures [Paper]	T. MURAYAMA, K. HIGASHI, K. IMANISHI and Y. ONO...998
Sintering Reaction and Operation	
Combustion Rate and NO Emission during Combustion of Coke Granules in Packed Beds [Paper]	E. KASAI, S. WU, T. SUGIYAMA, S. INABA and Y. OMORI...1005
Effect of Mineralogical Properties of Iron Ore on Its Assimilation with Lime [Paper]	Y. HIDA, J. OKAZAKI, K. ITO and S. HIRAKAWA...1013
Development of High-goethite Ore Self-densification Sintering Process [Paper]	Y. HIDA, J. OKAZAKI, K. NAKAMURA, K. UEKAWA and N. KASAI...1021
Commercial Production of Agglomerates for Blast Furnace Burdens Using a Large Amount of High Grade Iron Ore Fines [Paper] ...	Y. NIWA, N. SAKAMOTO, O. KOMATSU, H. NODA and A. KUMASAKA...1029
Achievement of High Productivity at a Semi-strand Cooling Type Sinter Plant [Paper]	K. KITAMURA, T. MIYAKE, K. YANAGISAWA, K. ONO and T. SHOUHO...1037
Modeling for Control Knowledge in Sintering Process Using Neural Network and Fuzzy Inference [Paper]	K. MATSUDA, N. TAMURA, K. NOSE, T. NODA, T. OKATA and K. OSUZU...1045
Sinter Cake	
Effect of Al ₂ O ₃ Content on Sinter Cake Structure [Paper]	T. KAWAGUCHI, S. KASAMA and T. INAZUMI...1053
Agglomeration and Densification Processes during Iron Ore Sintering [Paper] ...	T. INAZUMI and S. KASAMA...1061
Development of an Evaluation Method for the Pore Structure of Sinter Cake and Its Application to the Permeability Analysis [Paper]	S. KASAMA, T. INAZUMI and T. NAKAYASU...1069
The Relation between Fine Ratio and Particle Size of Sinter Product in Sinter Cake Sizing Process [Paper]	T. KAWAGUCHI and K. KURIYAMA...1077
Carbonization Phenomena and Coke Quality	
Analyses of Pyrolytic Gas and Steam Flow during Carbonization [Paper]	H. NOGAMI, H. NAKASHIMA and T. MIURA...1085
Mathematical Models for Coke and by-product Quality Control [Paper]	K. IGAWA, S. KASAOKA and H. OHSHIMA...1093
Mechanism of Coke Size Degradation by Mechanical Impact [Paper]	T. ARIMA, T. NISHI and T. OKUHARA...1101
Change in Size and Tensile Strength of Coke during Conveyance [Paper]	T. KAMLJO, H. IWAKIRI, J. KIGUCHI, T. YABATA, H. TANAKA, M. KITAMURA and H. NOMA...1109

The Estimation of Strength and Fracture of Metallurgical Coke by Thermal Shock [Paper]	
..... N. SUZUKI, S. ITAGAKI, S. MITANI, S. SATO, T. SUZUKI and T. OIKAWA...	1116
Blast Furnace Phenomena	
A Simulation Model on Fluid Flow and Heat Transfer in Packed Bed with Melting Phenomenon [Paper]	J. WANG, R. TAKAHASHI and J. YAGI...1124
Movement and Accumulation of Fines Generated in the Blast Furnace	M. ICHIDA, T. NAKAYAMA, K. TAMURA, H. SHIOTA, K. ARAKI and Y. SUGISAKI...1132
Analysis of Si Transfer Reaction in the Lower Part of Blast Furnace by Kinetics Theory [Paper]	T. SUGIYAMA, S. MATSUZAKI and H. SATO...1140
Estimation of Silicon Transfer Based on Radially Sampled Slag and Metal at Tuyere Level [Paper]	H. MITSUFUJI, M. SAKURAI, A. MAKI, T. SUMIGAMA and Y. NIWA...1148
Size Degradation of Dead-man Coke by Reaction with Molten FeO in Blast Furnace [Paper]	K. SUNAHARA, T. INADA and Y. IWANAGA...1156
Main Factors Affecting Static Holdup of Molten Slag in Coke-packed Bed [Paper]	H. OHGUSU, Y. SASSA, Y. TOMITA, K. TANAKA and M. HASEGAWA...1164
Influence of Low Permeability Zone in Blast Furnace Hearth on Temperature Distribution in Furnace Bottom and on Iron and Slag Tapping Indices [Paper]	Y. SAWA, K. TAKEDA, S. TAGUCHI, T. MATSUMOTO, Y. WATANABE and H. KAMANO...1171
Development of a Stave Cooler with High Stability of Blast Furnace's Working Profile and without Brick Laying Work [Paper] ...	F. ITO, A. HANAFUSA, Y. TAKEI, T. MITSUYASU and T. MIZUNO...1179
Injection of Pulverized Coal	
Outlook of Pulverized Coal Injection into a Blast Furnace [Commentary]	S. INABA and J. YAGI...1187
Temperature Measurement in Pulverized Coal Combustion Fields [Commentary]	K. OHTAKE...1198
Analysis of Phrolysis and Combustion Behavior of Pulverized Coal through Fundamental Experiments [Paper]	H. UENO, K. YAMAGUCHI and K. TAMURA...1206
Maximum Injection Rate of Pulverized Coal into Blast Furnace with Consideration of Unburnt Char [Paper]	K. YAMAGUCHI, H. UENO and K. TAMURA...1214
Simulation of Transport Phenomena around Raceway Zone in the Lower Part of Blast Furnace [Paper]	H. NOGAMI, T. MIURA and T. FURUKAWA...1222
Mathematical Model of Blast Furnace Raceway Zone with Pulverized Coal and Fine Ore Injection [Paper]	X. XINGGUO, K. NOZAWA, S. SASAHARA, M. SHIMIZU and S. INABA...1230
In-bath Smelting and Fluidized Bed Reduction	
Current State of Iron Ore Smelting Reduction Technology [Review]	T. MIYAZAKI...1238
Numerical Analysis of Combustion Mechanism in Iron Bath Type Smelting Reduction Furnace [Paper]	A. SHINOTAKE and Y. TAKAMOTO...1250
Sticking and Its Prevention in Fluidized Bed Reduction of Iron Ores [Paper]	K. MIYAGAWA, T. KAMIJO and M. DEGUCHI...1258
Circulation and Reduction Behavior of Iron Ore in Circulating Fluidized Bed [Paper]	M. SATO, H. ITAYA and S. TAGUCHI...1266
ISIJ Information Network	N 395
The Editor's Postscript	N 427