Part I    General Review

Advanced Steel and Our Society: Better Steel, Better World  ................. 3
Yong Gan

Innovative Steels for Low Carbon Economy  ............................ 9
Lejiang Xu

Development and Outlook of Advanced High Strength Steel in Ansteel  ...... 15
Xiaogang Zhang

Technical Progress and Product Development of TISCO Stainless Steel  ...... 19
Xiao Bo Li

The State of Steel Industry in India and its Future Prospects  ............... 27
Sanak Mishra

On the Performance Improvement of Steels through M³ Structure Control  . 35
Han Dong, Xingjun Sun, Wenquan Cao, Zhengdong Liu, Maoqiu Wang, and Yuqing Weng

High-Strength Steels: Control of Structure and Properties  ................. 59
A. S. Oryshchenko and E. I. Khlusova

Ultra-high Strength Steel Treated by Using Quenching–Partitioning–Tempering Process  67
T. Y. Hsu (Zuyao Xu) and Xuejun Jin

Part II    Physical Metallurgy Frontier

Long-term Stabilization of Steel Availability under Limited Resources  .... 77
Kotobu Nagai

Grain Boundary Carbon Segregation Estimated by McLean and Seah-Hondros Models  . 81
Setsuo Takaki, Nobuo Nakada and Toshihiro Tsuchiyama

Nano-Precipitates Design with Hydrogen Trapping Character in High Strength Steel  ................. 87
Fu-Gao Wei, Toru Hara and Kaneaki Tsuzaki

Micro-Mechanical Behavior of Inclusions in Advanced Steels  ............... 93
Xishan Xie, Yanpin Zeng, Miaomiao Wang, and Hongmei Fan

Dislocation Assisted Phase Transformation Observed in Iron Alloys  ....... 103
Yoon-UK Heo, Masaki Takeuchi, Kazuo Furuya, and Hu-Chul Lee
Solution and Precipitation of Secondary Phase in Steels: Phenomenon,  
Theory, and Practice .................................................. 109  
Qilong Yong, Xinjun Sun, Gengwei Yang, and Zhengyan Zhang

Ways to Manage Both Strength and Ductility in Nanostructured Steels ........ 119  
Nobuhiro Tsuji

Steels: Data Exploration for Discovery and Data-Sharing ................. 131  
Guoquan Liu

Long Life High Strength Steels to Resist Fatigue Failure  
and Delayed Fracture .................................................. 137  
Weijun Hui, Han Dong, Yuqing Weng, Jie Shi, and Maoqiu Wang

Part III Auto Sheet Steels

Metallurgical Perspectives on Advanced Sheet Steels  
for Automotive Application .............................................. 163  
Debanshu Bhattacharya

Recent Development of Nb-Containing DP590, DP780 and DP980 Steels  
for Production on Continuous Galvanizing Lines ....................... 177  

Lightweight Car Body and Application of High Strength Steels ............. 187  
Mingtu Ma and Hongliang Yi

Design of Lean Maraging TRIP Steels .................................... 199  
Dirk Ponge, Julio Millán, and Dierk Raabe

The 3rd Generation Automobile Sheet Steels Presenting with Ultrahigh  
Strength and High Ductility ............................................... 209  
Wenquan Cao, Jie Shi, Chang Wang, Cunyu Wang, Le Xu, Maoqiu Wang,  
Yuqing Weng, and Han Dong

Challenges Toward the Further Strengthening of Sheet Steel ................. 229  

Developments in High Strength Steels with Duplex Microstructures  
of Bainite or Martensite with Retained Austenite: Progress with Quenching  
and Partitioning Heat Treatment ........................................ 241  
David Edmonds, David Matlock and John Speer

Development and Application of Q&P Sheet Steels .......................... 255  
Li Wang and Weijun Feng

Microstructure and Mechanical Properties of Al-Added High Mn  
Austenitic Steel .......................................................... 259  
Jae-Eun Jin and Young-Kook Lee

Microstructure and Property Control of Advanced High Strength  
Automotive Steels ......................................................... 265  
Lin Li

Microstructure and Mechanical Properties of a TRIP Steel Containing  
7 Mass% Mn ............................................................. 275  
Seong-Jun Park, Chang-Seok Oh, and Sung-Joon Kim
Part IV Advanced High Strength Low Alloy Steels

Development of High Strength and High Performance Linepipe and Shipbuilding Steels ............................................... 281
Ki Kang Bong, Ju Seok Kang, Jang Yong Yoo, Dong Han Seo, In Shik Suh, and Gyu Baek An

MoNb-based Alloying Concepts for Low-Carbon Bainitic Steels ................. 289
Hardy Mohrbacher, Xinjun Sun, Qilong Yong, and Han Dong

Vanadium in Bainitic Steels: A Review of Recent Developments ............. 303
Yu Li and David Milbourn

Nanostructural Engineering of TMCP Steels ........................................ 309
Peter D. Hodgson, Ilana B. Timokhina, Hossein Beladi, and Subrata Mukherjee

Research of Low Carbon Nb-Ti-B Microalloyed High Strength Hot Strip Steels with Yield Strength ≥700 MPa ................................. 317
Hongtao Zhang, Chengbin Liu, and Ganyun Pang

Mechanical Properties and Microstructure of X80 Hot-Rolled Steel Strip for the Second West-East Gas Pipeline ................................. 333
Junhua Kong, Lin Zheng, Lixin Wu, Xiaoguo Liu, and Liwei Li

Refinement of Prior Austenite Grain in Advanced Pipeline Steel ............. 341
Chengjia Shang and Chengliang Miao

Part V Specialty Steels

Grain Boundary Hardening and Single Crystal Plasticity in High Nitrogen Austenitic Stainless Steels ........................................... 359
Markus O. Speidel

Unexplored Possibilities of Nitrogen Alloying of Steel ............................. 363
Jacques Foct

High-Nitrogen Steels: The Current State and Development Trends .......... 367
Anatoly G. Svyazhin, Jerzy Siwka, and Ludmila M. Kaputkina

Development of Stainless Steels with Superior Mechanical Properties: A Correlation Between Structure and Properties in Nanoscale/Sub-micron Grained Austenitic Stainless Steel ........................................... 371
S. Rajasekhar, L. P. Karjalainen, A. Kyröläinen, and P. J. Ferreira

Advanced Heat Resistant Austenitic Stainless Steels .............................. 385
Guocai Chai, Jan-Olof Nilsson, Magnus Boström, Jan Högberg, and Urban Forsberg

Research and Development of Advanced Boiler Steel Tubes and Pipes Used for 600°C USC Power Plants in China ........................................ 399

Strengthening Mechanisms in Creep of Advanced Ferritic Power Plant Steels Based on Creep Deformation Analysis ............................... 409
Fujio Abe

New Products and Techniques of Mould Steels ..................................... 423
Xiaochun Wu and Luoping Xu
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research on Large-size Pre-hardened Mould Blocks of Plastic Mould Steels</td>
<td>443</td>
</tr>
<tr>
<td>Dangshen Ma, Lin Wang, Aijun Kang, Qiang Guo, Yongwei Wang, Zaizhi Chen, Lihong Cao, Weiji Zhou and Nailu Chen</td>
<td></td>
</tr>
<tr>
<td>Developments and Challenges of China High-Speed Steel Industry over Last Decade</td>
<td>453</td>
</tr>
<tr>
<td>Lizhi Wu</td>
<td></td>
</tr>
<tr>
<td>Part VI Advanced Steel Processing and Fabrication</td>
<td></td>
</tr>
<tr>
<td>Study of Weldability of High Nitrogen Stainless Steel</td>
<td>465</td>
</tr>
<tr>
<td>Zhiling Tian, Yun Peng, Lin Zhao, Hongjun Xiao, and Chengyong Ma</td>
<td></td>
</tr>
<tr>
<td>Thermomechanical Processing and Role of Microalloying in Eutectoid Steels</td>
<td>475</td>
</tr>
<tr>
<td>J. M. Rodriguez-Ibabe and B. López</td>
<td></td>
</tr>
<tr>
<td>Study of Non-metallic Inclusions in High Strength Alloy Steel Refined by Using High Basicity and High Al₂O₃ Content Slag</td>
<td>485</td>
</tr>
<tr>
<td>Xinhua Wang, Min Jiang, Bing Chen, and Wanjun Wang</td>
<td></td>
</tr>
<tr>
<td>Formation of Ultrafine Grained Ferrite + Cementite Duplex Structure by Warm Deformation</td>
<td>495</td>
</tr>
<tr>
<td>Tadashi Furuhara and Behrang Poorganji</td>
<td></td>
</tr>
<tr>
<td>Pangang Rail Production System Innovation and New Products Development</td>
<td>501</td>
</tr>
<tr>
<td>Dongsheng Mei</td>
<td></td>
</tr>
<tr>
<td>The Influence of Strong Magnetic Field on Alloy Carbide Precipitation in Fe-C-Mo Alloy</td>
<td>509</td>
</tr>
<tr>
<td>Tingping Hou and Kaiming Wu</td>
<td></td>
</tr>
</tbody>
</table>
Advanced Steels
The Recent Scenario in Steel Science and Technology
Weng, Y.; Dong, H.; Gan, Y. (Eds.)
2011, X, 511 p., Hardcover
ISBN: 978-3-642-17664-7