

Table of Contents

Preface

Chapter 1: Properties and Processing Technologies of Structural Alloys and Intermetallic Compounds

Effects of Solid Solution Temperature on Microstructure and Properties of Extruded and Forged FGH95 Superalloys Z.C. Peng, X.Q. Wang, Y. Zhang, Y.F. Feng and X.S. Fan	3
Creep Properties and Microstructural Evolution at 760°C/785MPa of a Re-Containing Single Crystal Superalloy Y.S. Zhao, Y.F. Liu, J.X. Zhao, X.T. Zhang, Y. Yang, H. Chen, H. Jiang and Y.S. Luo	8
Thoughts on High Performance Superalloy Design and Microstructural Characteristics of a Newly Designed Ni-Cr-Co-W Superalloy Applied above 850°C X.M. Xiang, H. Jiang, J.X. Dong and Z.H. Yao	13
Microstructure-Dependent Deform Behavior of a Polycrystalline Ni-Based Superalloy Based on Micropillar Compression G.F. Tian, Y. Chen, B. Gan, Y. Yang and J.W. Zou	25
Double Annealing Processes of Ti-5Al-5Mo-5V-1Cr-1Fe Titanium Alloy Q.R. Wang, A.X. Sha, L.J. Huang, X.W. Li and G.B. Mi	33
Thermal Deformation Behavior and Critical Conditions of Dynamic Recrystallization of QCr0.8 Alloy S.Y. Yang, Q.S. Wang, G.L. Xie, D.M. Liu and F. Liu	38
Effect of UDC Casting on Hot Deformation Behavior and Properties of 2A14 Aluminum Alloy Y. Qiu, Z.F. Zhang, H.D. Zhao, B. Li and C.S. Chen	46
Numerical Simulation of Electromagnetic Phenomena and Solidification under a Pulsed Magnetic Field Q.P. Chen, H. Oguma and H.F. Shen	52
Effects of Different Mold Temperature on Dendrite Morphology of Sn-Bi Alloy in Directional Solidification J.H. Luo and H. Xu	59
Microstructure and Mechanical Properties of TiB₂/ Al-Si Composites Fabricated by TIG Wire and Arc Additive Manufacturing Q.F. Yang, C.J. Xia and Y.Q. Deng	64
Effects of Hot-Rolled Process and Heat Treatment on Microstructure and Mechanical Properties of Ti-6Al-4V ELI Alloy E.T. Dong, W. Yu, Q.W. Cai, J.X. Shi, Z. Ning and Z.Y. Zhang	73
Effect of Preparation Process on Surface Quality and Microstructure of Titanium Sheet Z.Y. Zhang, W. Yu, E.T. Dong and J.X. Shi	79
Effect of Lubrication Conditions on the Forming Limit of Deep Drawing of 6061 Aluminum Alloy Sheet Y.Q. Wang, Y.Q. Cheng, P. Zhang, G. Luo, P.B. Li and K. Jiang	85
Multi-Scale Microstructure Regulation Technology of Near-α High Temperature Titanium Alloy X. Qiao, B.L. Li, T.B. Wang and Z. Nie	92
Effect of Processing Techniques on the Mechanical Property of New Zirconium Alloy Strip P.F. Zhang, X.K. Hu, G.C. Sun, B. Gao and B. Xu	99
Effect of Ultrasonic Impact Treatment on the Residual Stress Distribution of Electron Beam Welded TA15/BTi-6431S Dissimilar Titanium Alloys X.Y. Song, G.L. Qian, M.Y. Zhao, Y.W. Diao, W.J. Ye and S.X. Hui	104
Influence Mechanism of Cu on High Temperature Oxidation Behavior of Titanium Alloys H. Chen, G.B. Mi, P.J. Li and C.X. Cao	110
Fatigue Crack Growth Behaviors in Novel TC32 Titanium Alloy with Bimodal and Basket-Wave Microstructures M.B. Li, Z.S. Zhu, X.N. Wang, L.W. Zhu, G.Q. Shang, J. Li and G.C. Liu	120

Combustion Microstructures and Frictional Ignition Resistance of Ti-6Al-4V Titanium Alloy	127
G.B. Mi, X. Huang, J.X. Cao, B. Wang and C.X. Cao	
High Temperature Deformation Behavior in the Isothermal Compression of Ti-5Al-4Mo-2Cr-4Zr-2Sn-1Fe Alloy	135
H.M. Sun, Y.L. Qi, W. Liu and X.N. Mao	
Influence of Different Surface Treatments on Fatigue Life of 7050 Al Alloy	142
N. Li, H.T. Li, J.Y. Zhou, H.T. Liu, C.K. Liu and S.Y. Qu	
Thermodynamic Study on Equilibrium Phases in Nickel-Base Single Crystal Superalloys	149
J.S. Wang	
Numerical Simulation of Dendrite Growth and Micro Segregation of Ni-Cu Alloy	155
M.G. Wang and S. Jiang	
High Compressibility ZrTiHfV_{0.5}Nb_{0.5}C_X Refractory High-Entropy Alloys	163
W.K. Chen, Y.K. Li and Y.W. Chen	
Phase Stability and Mechanical Properties of FCC Structural CoCrCu_{0.5}FeNi High-Entropy Alloy with Silicon or Boron Addition	169
C. Chen, N. Liu, P.J. Zhou and H.F. Xiang	
Interfacial Reaction of CoCrFeNi High Entropy Alloy in Molten Al	176
Y. Hu, J.T. He, Y.C. Wu, Y. Dong and Z.R. Zhang	
Selective Laser Melting of Multi-Principal NiCrWFeTi Alloy: Processing, Microstructure and Performance	
B.W. Wang, P. Luo, L.J. Zhang and B.H. Lu	182

Chapter 2: Properties and Processing Technologies of Steels and Structural Metals

Influence of Cold Rolling Reduction on Microstructure and Mechanical Properties in 204C2 Austenitic Stainless Steel	193
T.Y. Wang, R.B. Song, H.J. Cai, J. Wen and Y. Su	
Effect of Primary Annealing Temperature on Primary and Secondary Recrystallization in Strip-Cast Grain-Oriented Silicon Steel	199
X. Lu, M.F. Lan, F. Fang, Y.X. Zhang, Y. Wang, G. Yuan, W.N. Zhang and G.D. Wang	
The Effects of Current Density on Microstructure and Properties of Electrolytic Copper Foils	
X. Cheng, Y.F. Li, G.J. Huang, X.Q. Yin, Y.Z. Li, E.D. Yao, X.L. Ma, X.S. Xie, S.L. Qi and Z.M. Li	205
High-Precision Section Control Technology for High-Strength Yoke Steel Strip	212
H.N. He, X.C. Wang and Q. Yang	
Effect of Annealing Treatment on Microstructure, Mechanical and Damping Properties of Ductile Iron	
Y. Zhang, E.J. Guo, L.P. Wang, Y.C. Feng, S.C. Zhao and M.H. Song	222
Evolution of Grain Boundary Character Distribution in Pure Copper during Low-Strain Thermomechanical Processing	
G.Q. Wu, Z.Y. Chen, M. Huang, Y. Qin, A. Ablat, H.L. Jiang and S. Yang	229
Optimization Technology of Roll Contours during Skin-Pass Rolling Process of Hot-Rolled Strip	
G.Y. Song, X.C. Wang, Q. Yang and J.W. Zhao	237
Physical Modeling of Flow Stress during the Hot Deformation of Nb Steels	
J.W. Zhao, Q. Yang and X.C. Wang	247
Microscopic Failure Mechanism of Zinc Layer in Galvanized Sheet during Sheet Forming Process	
Y. Huang, L.G. Wang, X. Ma and L. Liu	254
Hot Ductility Behavior of 9SiCr Alloy Tool Steel by Thin Slab Casting	
W.J. Zhu, C.F. Wang, J.H. Qi, Y.Q. Sun, C. Zhen and C. Qiu	259
Effect of Hot Rolling Process Parameters on Microstructure Transformation and Microstructure of 45MnSiV Steel	
Y.L. Wang, Y.L. Chen, H. Wei, Y.N. Zhao and Z.S. Liu	265

Study on Continuous Cooling Transformation and Microstructure of 500 Mpa Grade Steel for Railway Freight Car Body	272
M.L. Jiang and W. Yu	
Microstructure and Mechanical Properties of Ferritic Rolling Low Carbon Steel	278
H. Zhao, P.F. Cheng and X. Zhou	
Effect of Process Parameters on Microstructure and Properties of 1500 MPa Grade Hot Formed Steel without Boron but Containing Niobium	283
Z.N. Cui, Y.L. Kang, G.M. Zhu, B.S. Li, Q.Q. Qiu, R.D. Liu and H.B. Liu	
Causes and Control Mechanism of Abnormal Structure in the Center of SWRH82B Wire-Rod-Steel	294
L.L. Liao, H. Wei, L.Z. Li, Y.L. Chen, H.F. Yan and G.H. Liu	
Continuous Cooling Phase Transformation Rule of 20CrMnTi Low-Carbon Alloy Steel	303
L.Z. Li, H. Wei, L.L. Liao, Y.L. Chen, H.F. Yan, G.H. Liu and Z.W. Sun	
Solution Treatment of 20LH5 Chromium-Manganese Austenitic Stainless Steel	313
Y. Su, R.B. Song, H.J. Cai, J. Wen and T.Y. Wang	
Titanium Nitride and Niobium Carbide in the Ferritic Stainless Steel and the Influence to Casting Macrostructure	322
H.K. Du, D.X. Xia, C.J. Shang and K. Chen	
Simulation Experimental Study on Ferrite Rolling Process of Low-Carbon Steels	329
F. Wang, P. Tian, Y.L. Kang, J.T. Zhu, Z. Qin and L. Chen	
Effect of Annealing Processes on Microstructures and Mechanical Properties of Medium Mn Steel	337
R. Dong, K. Lv, H. Guo and A.M. Zhao	
Achievements of Endless Strip Production in Rizhao Steel	344
P. Tian, Y.L. Kang, J.T. Zhu, Z. Qin, X.T. Zheng and F. Wang	
Optimization of Quenching Process Parameters of 15CrNiMo Steel Used for Roller Bit Bits	351
S.R. Su, R.B. Song, C. Chen, W.S. Ji, S.D. Li and M.L. Li	
Effect of Austenitizing Temperature on the Quenching Microstructure and Properties of 51CrV4	357
X.D. Zhang, D.X. Xia and S.R. Wang	
Effect of Rare Earth Elements on the Inclusion Behavior in Low Alloy Structural Steel	364
N. Yin, C.L. Jing, H.B. Li, R.S. Chu and B. Chen	
Effect of Heat Treatment on the Precipitation Behavior and Hardness of the Second Phase of 0Cr21Mn17Mo3N0.8 High Nitrogen Alloys	373
Y. Yang, Y.X. Xu, Z.W. Chen and Y. Huang	
Study of Helium Bubble Induced Hardening in BCC-Fe by Molecular Dynamics Simulation	378
L.X. Jia, X.F. He, S. Wu, D.J. Wang, H. Cao, Y.K. Dou and W. Yang	

Chapter 3: Surface Engineering and Wear Resistance of Machine Parts

Relationship between Corrosion Resistance and Microstructure of Copper-Nickel Alloy Pipes in Marine Engineering	389
Z.J. Tan, T.D. Ma, L.M. Zhang, W.M. Zhang, R.G. Jia, D.D. Cao and H. Ji	
Corrosion Behavior and Mechanism of Heat-Resistant Steel T91 in High-Temperature Carbon Dioxide Environment	398
Y. Gui, Z.Y. Liang, M. Yu and Q.X. Zhao	
Analysis of Transverse Cracks Forming in a Railway Axle	404
H.X. Yin	
Service Temperature Evaluation of Cast K465 Superalloy Turbine Vane Based on Microstructural Evolution	411
Z. Zheng, J.Y. Zhou, W.X. Zhao and Y.R. Zheng	
Effects of Gas Film Hole on Mechanical Property and Oxidative Damage of Turbine Blades	421
C.Y. Hu, Z.Q. Kong, X.L. Liu and C.H. Tao	
Fractal Characterization of Relative Movement Modes in Simulated Friction and Wear Tests	426
W. Jiang, C.C. Ji, D.D. Zhang, H.X. Xiao and Y.T. Dai	
Anti-Oxidation Performance on Graphite Prepared by Plasma Electrolysis Technology	432
Y.F. Zhang, W.W. Chen, A.M. Bu, Y. Xiang, H.W. Cheng and L. Wang	

Typical Failure Forms and Cause Analysis of High Speed Railway Wheels	439
G.Z. Zhang, R.M. Ren and H.X. Yin	
Microstructure and Mechanical Properties of Aluminum Alloy/High Strength Steel Double Beam Laser Deep Penetration Welded Joint	439
H.X. Chen, L. Cui, D.Q. Lu, Y.Q. Chang, X. Xia and D.Y. He	
Effect of LBE Corrosion on Surface Wettability of Ti_3SiC_2 at 450°C	448
H. Rui, H.P. Zhu, F.L. Niu, Y.G. Zhao, Y. Zhang, A.X. Yang and T. Zhou	
Effect of Precipitate on Thermal Aging Effect of 17-4PH Martensitic Stainless Steel Used as Valve Stem in Nuclear Power Plant	458
B. Bai, C.Y. Zhang, P.P. Zhang and W. Yang	
Technology and Antimicrobial Properties of Cu/TiB₂ Composite Coating on 304 Steel Surface Prepared by Laser Cladding	466
Y. Sun, V. Tran, D. Zhang, W.B. Wang and S. Yang	
Corrosion Behavior and Oxide Films of New Zirconium Cladding Corroded at Different Conditions	473
J.J. Liao, Z.B. Yang, S.Y. Qiu, Z.C. Li and Q. Peng	
Effect of Final Annealing Temperature on Corrosion Resistance of SZA-6 Zirconium Alloy Cladding Tubes	480
Z.B. Yang, J.J. Liao, S.Y. Qiu, Z.Q. Cheng, H. Liu, Z.P. Wu, J. Qiu and B. Gao	
Formation and Properties of Fe-Based Amorphous/Nanocrystalline Alloy Coating Prepared by Wire Arc Spraying Process	488
D. Wu, Z.S. Fan and Y. Yang	
	499

Chapter 4: Nanomaterials and Advanced Functional Materials

Properties of PP Wood-Plastic Composites with Biocompatibility Additives	509
S.S. Liu, H.Y. Ge, Y. Zou and J. Chen	
Preparation and Properties of Reflective Heating Polyethylene Terephthalate Fiber	515
J.P. Huang, L. Tang, S. Zhang, J.W. Li and C.S. Wang	
Effect on Properties of Corn Straw Fibers Reinforced Polypropylene Composites	521
S.S. Liu, H.Y. Ge, Y. Zou and J. Chen	
Crystal Structure and Multiferroic Behaviors of Solid Solution $(1-y)BiFe_{(1-x)}Mn_xO_3-yBaTiO_3$	526
M.M. Wu, L.F. He, G.H. Wei and Y.Q. Li	
Effect of SiC Additions on Microstructure Evolution and Mechanical Properties of W-Based Composite Prepared by Arc-Melting	531
K.J. Kang, P. Fan, J. Zhang, Q.G. Luo, Q. Shen and L.M. Zhang	
Tough Hydrogels Based on Macromolecules as Crosslinkers with pH and Ion Sensitive Properties	537
R.J. Yan, Y.Z. Yan, J.H. Ma and J.H. Gong	
Continuous Fabrication of Temperature-Responsive Hydrogel Fibers with Bilayer Structure by Microfluidic Spinning	543
M.L. Zhou, D.M. Hu, Y.J. Shao, J.H. Ma and J.H. Gong	
The Bending Behavior of Porous Titanium Manufactured Using a Novel Spherical Space Holder	549
B.Q. Li, X.M. Li and X. Lu	
Preparation and Characterization of pH Responsive Complex Micelles with Dynamic Boronate Cross-Linking	557
J.M. Xu, D.Y. Wang, H. Tong, X.Z. Jiang and M.F. Zhu	
Deformation and Residual Stress Measurement of Alumina Ceramics after Dynamic Impacts	565
Y.F. Gao, Z.X. Si, M.Y. Zhao and L.X. Yang	
Microstructures and Properties of Spinning for Silicon Carbide Particle Reinforced Aluminum Composite	571
H.B. Wu, J.Z. Li, D.F. Li, D.G. Liu and G.Q. Chai	
Laser-MIG Hybrid Keyhole Welded 6mm Steel/Aluminum Butt Joints	581
D.Q. Lu, L. Cui, H.X. Chen, Y.Q. Chang, Z.B. Peng and D.Y. He	

Joints Properties of Aluminum Foams/Aluminum Plate by Transient Liquid Phase Bonding Process	
B.S. Huang, X. Wen, X. Zhao and G.W. Li	593
Effect of the Gamma-Ray Irradiation on the Properties of an Epoxy Encapsulant	
Y.F. Li, S.L. Hu, Z.B. Zeng, X. Liu, W. Xiang and M.Z. Xiao	600
Defect Engineering in Antimony Telluride Phase-Change Materials	
Y. Wang, K. Ren, S.N. Song and Z.T. Song	607
Activation Process and Mechanism of ZrCoCe Getter Films	
Y. Xu, Y.Z. Sui, X. Zhang, H. Liu, P. Yuan and F. Wei	613
Preparation and Characterization of Ni/ZrCoCe Stack Getter Films	
P. Yuan, Y.Z. Sui, X. Zhang, H. Liu, F. Wei and Y. Xu	619
Magnetic Anisotropy in [Pt/Co]₄/MgO/[Co/Pt]₂ Multilayers	
Q. Li, L. Li, W. Zhou, J. Chen, S.Y. Zhang and J.H. Cai	625
Characterization and Mechanism Analysis of Growth Bands in Chemical Vapor Deposited ZnS	
P.F. Zhang, H.W. Li, H. Yang, N.G. Wei, J.M. Li and D.X. Li	631
Development and Potential Application of Advanced Functional Materials in the Oil Field	
G.F. Zhao, W.N. Di and R.Y. Wang	637
Preparation of Porous CoS₂ Nanostructures for Highly Efficient Electrocatalytic Hydrogen Evolution	
K. Wang, H.Z. Song, W.L. Guo and S.C. Yan	643
Micromorphology and Characterization of V₂O₃ Nanoparticles Produced by the Liquid Phase Reduction-Heat Treatment	
M.R. Zhang, Y. Qin, D. Zhang, G.Y. Wang and S. Yang	650
A Strategy to Improve O₂ Gas Response of La-SnO₂ Nanofibers Based Sensor through Temperature Modulation	
Y. Xiong, H. Li, T.C. Guo and Q.Z. Xue	657
Technical Study on Preparation of Co/C Composite Nanofibers via Electrospinning	
S. Zhang, J.J. Wang and F. Zhao	666
Preparation of Pd@Gr Composite Materials and Research on Catalytic Performance	
J.F. Leng, K. Wang and C.P. Xia	671
Diffusion Phenomenon of Cathode Components in YSZ Electrolyte and Effect on Mechanical Properties of SOFC	
S. Shen, D. Yan, J. Pu, B. Chi and L. Jian	678
Preparation and Antibacterial Properties of Silver Nanowires	
Y.H. Zhou	686
Preparation of High Sphericity Li₂TiO₃ Tritium Breeder by Polymer Assisted Sedimentation Method	
C. Zhipeng, W. Lu, D.L. Chu, W.H. Wang, W.J. Pu, H.Y. Jiang, Z.H. Pan, S.B. Ma, H.F. Deng and J.L. Qi	692
Effect of Fluorine-Containing Additive on the Electrochemical Properties of Silicon Anode for Lithium-Ion Batteries	
J. Wang, X.H. Yang, Y.F. Su, S. Chen and F. Wu	699
Effect of Nickel-Modified SiC Particles on Compressive Damage of SiCp / 7075 Composites	
X.H. Wang, Q.G. Hu, S.Y. Zhong, T. Dang, H.L. Wang and Y.H. Lin	705
Influence of Calcination Temperature on Structure and Electrochemical Behavior of LiNi_{0.83}Co_{0.11}Mn_{0.06}O₂ Cathodes for Lithium-Ion Batteries	
J. Wang, D.H. Li, R. Wang, S. Chen, Y.F. Su, A. Gao, D.Y. Ji and F. Wu	714
A Novel Electrochemiluminescence Sensor for the Detection of Butyl Hydroxy Anisid and Gallic Acid Based on Graphene Quantum Dots	
C.L. Zang, C.L. Wang, T.H. He, W.J. Liu, K.J. Cao, L. Tu, Y.M. Han, Z.C. Yang, Z.Y. Liao and W. Qi	721
Brief Analysis on Application of PVC Foam Materials in Building Material Industry	
X. Xu and Q. Jiang	729
Preparation of EVA Emulsion Self-Healing Capsules for Concrete and Evaluation of Healing Properties	
Y. Zhang, W. Du, Y. Li and J.Y. Yu	736

Chapter 5: Computational Procedures in Materials Science

Phase Field Simulation for Abnormal Growth of Grains by the In-Homogeneous Grain Boundary Energy

Y. Wu, E.W. Qin and Q. Yu 747

Research on the Springback of Square TA18 Titanium Alloy Tube on the Numerical Simulation

C. Liu, X.D. Yan, Y. Yang and W. Ye 753

First-Principles Investigations on the Elastic Properties of Platinum Group Metals (Pt, Pd, and Ru)

Y.J. Sun, K. Xiong, S.M. Zhang and Y. Mao 761

A Mathematical Model on Macro-Segregation Formation for Popular Bloom Continuous Casting Process

H.B. Sun, Z. Li, L.J. Li and B.H. Nie 770

Numerical Simulation of Stagger Spinning for D406A High-Strength Steel

K.D. Li, D.G. Liu, J.S. Li, B. Tang and H.C. Kou 778

A Phase-Field Model for Multilayered Heterostructure Morphology

P.P. Wu, G. Wang and S.M. Pang 788

Chapter 6: Materials and Technologies in Production and Exploitation of Tubular Goods

Study of Temperature Effect on the High Performance of OCTG Used for Deep and Ultra-Deep Well

W.H. Liu, D.S. Qin, Z.Y. Pan, Y. Long and K. Lin 797

Development and Application of Sour Service Pipeline Steel with Low Manganese Content

Y.H. Li, Q. Chi, W.W. Li, B. Zou, P. Xie, M.J. Hu and M. Yang 808

Corrosion Behavior of P110S Oil Pipe in Simulated Working Condition

X.J. Fang, L. Liu, Z.G. Yang and Y.Q. Zhang 815

Mechanical Properties of Girth Weld with Different Butt Materials Severed for Natural Gas Station

J.J. Ren, W.F. Ma, X.L. He, A.Q. Chen, J.H. Luo, K. Wang, Q.R. Ma and C.Y. Huo 821

Tubing String Thread Sealing Surfaces Damage Evaluation Based on Acoustic Elasticity Theory

J.J. Wang, J.H. Sun, S.Y. Yang, Y.R. Feng and K. Lin 828

Simulation Analysis of the Pressure Carrying Capacity of X80 Pipe with Plain Dents

P. Song, Z.L. Li, Y.R. Fan, L. Guo, X.X. Zhang and Y.C. Wei 835

Microscopic Study on Mechanical Properties of Different Microregions during In-Service Welding

L. Qiao, T. Han, H.T. Wang, L.H. Han and S.W. Gu 841

Effect of Type B Steel Sleeve Rehabilitate Girth Weld Defect on the Microstructure and Property of X80 Pipeline

W.F. Ma, J.J. Ren, H.P. Zhou, K. Wang, J.H. Luo, X.W. Zhao and C.Y. Huo 854

Corrosion Behavior and Safety Analysis of 80S Steel in H₂S/CO₂ Environment

Y.Q. Zhang, Z.G. Yang, R.M. Gao, L. Liu, Z.F. Yin and C. Ta 862

Pressure Capacity Study of Φ100 Reinforced Thermoplastic Pipe

L. Wang, Y.R. Fan and P. Song 867

Combination Application Strategy of Non-Metal Compound Pipe and its Verification

Y.Q. Zhang, L. Liu, Z.G. Yang and C. Ta 873

Influence of Heterogeneous Reservoirs with Different Depths on Casing Deformation in Fuling Area

N. Ma and J. Li 881

Deformation Stability of a Low-Cost Titanium Alloy Used for Petroleum Drilling Pipe

L. Jiang, C. Feng, H.Q. Liu, L. Wang, L.H. Han, Y.R. Feng, F.P. Li, C.H. Lu, L.J. Zhu, H. Wang and S.Y. Yang 887

Status and Influence of Shale Gas Well Integrity Failure

W.B. Zhai, J. Li, Y. Xi, G.H. Liu and Y.C. Zhou 892

Horizontal well of Shale Gas Complex Fracturing Casing Failure Mechanism	898
S.Y. Yang, J.J. Wang, G.X. Liu and L.H. Han	
Research Status and Development of Titanium Alloy Drill Pipes	903
R.Z. Li, C. Feng, L. Jiang and Y.Q. Cao	
The Erosion-Corrosion Behaviors of the Full-Scale PFF78-70 Flat Valve and P110SS Tubing	910
L.J. Zhu, C. Feng, S.Y. Yang, L.H. Han, J.T. Yuan, C.H. Lu, H. Wang and N.X. Lyu	
Experimental Analysis on Mechanical Properties of Perforated Casing in Complex Fracturing	918
L.H. Han, G.X. Liu, S.Y. Yang and P. Wang	
Development of Characterization and Analysis Methods for Graphene Modified Coatings for Tubing	923
Y.Q. Cao, C. Feng, L.J. Zhu and R.Z. Li	
Failure Analysis on Leakage of the Circumferential Weld of Steel 20 Buried Pipeline	930
T.T. Qu, K. Tong, L.X. Zhu, S. Cong and C.H. Lu	
Fracture Toughness and Application of X80 Pipeline Steel	938
H. Zhang, H. Zhang and C.H. Lu	
Study on Welding Techniques of 316L Lined Bimetallic Pipe	944
F.G. Li, X.J. Li, W.W. Li, X.M. Li, Z.L. Chang and Q. Feng	
Technical and Economic Analysis on Bimetallic Clad Pipes for Sour Service	950
F.G. Li, X.J. Li, A.Q. Fu, Z.L. Chang, X.M. Li and Q. Feng	
Corrosion Strength Analysis of Casing in Offshore Thermal Recovery Wells	956
J. Li, X.F. Song, G.H. Liu, Y. Xi, W. Lian and T. Huang	
Application of 0.8 Design Factor in China Gas Pipeline	965
K. Wang, J.H. Luo, W.Y. Hui, X.W. Zhao, W.F. Ma and C.Y. Huo	
Research on Drill Pipe's Fatigue Life Prediction Based on Reliability	975
F.P. Li	
Changes in Corrosion of X70 Steel in Water-Saturated Supercritical CO₂ System Caused by Impurity	981
T. Jiang, J.B. Sun, J.H. Li, Y.H. Ning, D.M. Liu, C. Sun and J. Yin	
Casing Shear Deformation Analysis of Shale Gas well Based on Shale Formation Strength Reduction Method	991
Y.J. Zeng, J. Li, S.D. Ding, Z. Xu and W. Lian	
Research on Design of Polycrystalline Diamond Composite Pendulum Wear-Resistant Belt	999
W. Wang, J. Li, G.H. Liu and C.Q. Cha	
Influence of the Riser Boost Line on the Thermal Stress of Riser in Deepwater Drilling	1005
K.D. Luo, J. Li, H.W. Yang, J.S. Wang and X. Zhang	
Casing Shear Deformation Based on Micro Seismic Data	1011
Y.J. Zeng, Y. Xi, S.D. Ding, J. Li, X.Y. Hao, F.Y. Li and H.T. Wang	
Influence of Casing Pressure Test on Seal Integrity of Cementing First Interface	1020
J.W. Jiang, J. Li, G.H. Liu, Y. Xi and W. Li	
Influence of the Characteristics of Cement Plug on well Integrity for Offshore Abandonment	1028
X. Zhang, J. Li, C.J. Zhao, K.D. Luo and D. Zhang	
Corrosion Behavior Research of Aluminized N80 Tubing in Water Injection Well	1035
C.H. Lu, C. Feng, L.H. Han, J. Feng, L.J. Zhu, L. Jiang and Y.R. Feng	
Characteristic Analysis of Downhole Pressure Signal while Drilling under Drillstring Washout Conditions	1040
J. Li, K. Ren, H.D. Chen, H.L. Jiang, C. Wang and T. Huang	
Analytical Method to Evaluate Casing Stress during Multi-Fracturing for Shale Gas Wells	1050
X.L. Guo, J. Li, Y.J. Zeng, S.D. Ding and X. Zhang	
Erosion Law of Inner Drill Pipe in Reelwell Reverse Circulation Directional Drilling	1061
J. Li, T. Huang, D.W. Gao, C. Wang, X.F. Song and K. Ren	
Low Cycle Fatigue Behavior of N80Q Steel under the Influence of Mean Strains	1067
W.L. Wei, L.H. Han, Y.R. Feng, J.X. Zhang and H. Wang	
Nitrates Induced Stress Corrosion Cracking in Tubing Connections from Oil Well	1076
P. Wang, G. Gao, M.X. Xiong, N. Ji, X.H. Wang and Y.R. Feng	

Properties of CT130 Grade Coiled Tubing Y. Liu, L.Y. Xian, H. Yu, H.B. Li and F. Wei	1082
Stress Analysis and Microstructure Evolution of Titanium Alloy Pipe during Flattening Processing J. Chen, S.W. Xin, W. Zhou, Q. Li, S.Y. Zhang, L. Li, H.Y. Yang and T.X. Wang	1088
Stress Analysis of Hollow Proppant Based on Finite Element Method X.G. Li, Z.j. Liao, Z.Z. Yang, J.Y. Xiong and Y. Li	1094
Mechanical Properties and Microstructure of Epoxy Resin Enhanced Oil-Well Cement Stone M.D. He, M. Li, Y.J. Yu, W.Y. Xiao, H. Wang and J.L. Yang	1103

Chapter 7: Materials and Technologies for Environmental Engineering and Waste Recycling

Preparation of Non-Fluorine Glass Ceramics from Modified Molten Blast Furnace Slag W.T. Zhang, F. He, J.L. Xie, Y.L. Li, X.Q. Liu, D. Fang and H. Yang	1111
Adsorption of Congo Red from Aqueous Solution Using La/MFA Composite as Adsorbent B.G. Li and X.H. Lin	1117
Life Cycle Assessment of Lead Production in China W.Y. Sun, X.Z. Gong, B.X. Sun and Q. Ding	1123
Life Cycle Assessment of Erbium Oxide and Scandium Oxide X.D. Zhang, F. Gao, X.Z. Gong, Z.H. Wang and Y. Liu	1130
Life Cycle Assessment of Tungsten Production in China K.W. Lu, X.Z. Gong, B.X. Sun and Q. Ding	1137
Fabrication of 1D Nanometer Tungsten Trioxide under Different Solvent System L.Y. Zhao, Y.G. Shen, Y.S. Fan, L.W. Ma and X.L. Xi	1144
Study on Typical Visible Light Photocatalytic Liquid under the Life Cycle Assessment Y.J. Zhang, W.X. Liu, W.B. Cao, C.Z. Zhao and J.J. Peng	1152
Study of Technical Specification Development for Ready-Mixed Concrete Type III Environmental Declarations Y.J. Zhang, L.P. Ma, Q. Jiang and C.Z. Zhao	1158
Effect of Chemical Composition on the Properties of Reconstructed Steel Slag Y. Xu, Q.L. Wang, C.G. Hu and S.S. Yang	1163
Effect of Chelating Additive on Pore Structure and Mechanical Property of Mortar under Different Curing Conditions P. He, R.Y. Wang, Y.G. Zha and J.Y. Yu	1172
Preparation of Regenerated Cathode Material Lithium Nickel Cobalt Oxide $\text{LiNi}_{0.7}\text{Co}_{0.3}\text{O}_2$ Form Spent Lithium-Ion Battery Y.H. Wang, L.W. Ma, Y.H. Zhang, Z.J. Huang and X.L. Xi	1179
Study on Movement of Particles in RF Plasma Deposition Process Y.C. Sun, X.F. Song, X.R. Du, X.Q. Zhang and N. Hua	1187
Synthesis and Preparation of Al-MCM-41 Mesoporous Materials Using Oil Shale Residue R. Wang, Z.X. Lin, Y. Zhao, X.D. Xu and Y.X. Deng	1192
Numerical Simulation of Internal Flow Field in Blast Furnace Slag Dry Granulating Device R.Y. Wang, J.Y. Yin and S.P. Cui	1199
Analysis of the Volatile Organic Compounds (VOCs) during the Regeneration of Post-Consumed Poly(Ethylene Terephthalate) Using HS-GC-MS Method S.S. Liu, J.Y. Hu, D. Qin, L.L. Gao, Y. Chen, F.Y. Ke, C.S. Wang and H.P. Wang	1208
Effect of the Cement Raw Meal Rate Value on SNCR deNOx Efficiency with NH₃ as Reducing Agent Y.L. Wang, N. Li, H.Z. Zhang, S.P. Cui and Y.N. Zhang	1215
Investigation of Volatile Organic Compounds from the Manufacturing Process of Recycled PET Fibers Using TGA-DTA/MS Technique J.Y. Hu, Y. Chen, S.S. Liu, F.Y. Ke, L.L. Gao, C.S. Wang and H.P. Wang	1221
Effect of Warm Mix Agent on Physical and Aging Properties of Crumb Rubber Modified Bitumen R.H. Zhuang, J.Y. Yu, H. Chang, Y. Zeng and X.Y. Lan	1226

A Novel Approach for the Recycling and Reusing of Silicon Slurry Waste H.L. Hu, H.B. Li, W.J. Yu, Y.Z. Jiao, T.Y. Dong, B.G. Lv and J.L. Sun	1234
Analysis of Mechanical Performance and Microstructure of Steel Slag Processed with Accelerated Carbonation Q.S. Wu, H.X. Gu, T. Yang, C.S. Zhang, Z.A. Min and Y. Wu	1240
Preparation and Properties of SBS Modified Deoiled Asphalt and Slurry Blends Y. Gu, Y.S. Li, X.Q. Huang and J.Y. Yu	1252
Research Status of Recovery of Indium from Indium-Tin Oxide (ITO) Targets S.F. Chen, Y. Deng, H. Xiong and H.C. Lei	1259
Phase Separation of Fe-Cu-Pb Alloy and Recycling of Mixed Metals in Waste Printed Circuit Boards B. Chen, J. He and J.Z. Zhao	1265