

Mechanical Automation and Materials Engineering

**Selected, peer reviewed papers from the 2nd International Conference on
Mechanical Automation and Materials Engineering (ICMAME 2013)**

Applied Mechanics and Materials Volume 364

**Wuhan, China
9 – 11 August 2013**

Editors:

D. Chen

**ISBN: 978-1-62993-339-9
ISSN: 1660-9336**

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2013) by Trans Tech Publications Ltd.
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact Trans Tech Publications Ltd.
at the address below.

Trans Tech Publications Ltd.
Laubisrutisr 24
CH-8712 Stafa-Zuerich
Switzerland

Fax: +41 (44) 922 10 33 Fax: +1 (603) 632-5611
e-mail: sales@ttp.net

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

Table of Contents

Preface, Committees and Sponsors

Chapter 1: Research and Design in Mechanical Engineering

Design and Optimization of the X Direction Sideway Face Camber Curve of Super-Span Cross-Rail L.G. Cai, Z.L. Wang and T.N. Guo	3
Research and Improvement on Feed Box for BQ220 Beam J.Z. Zhang, Y.J. Meng, Z.F. Yao, Y.Y. Liu and X.P. Xie	10
The Body Design and Body Flow Passage Digital Simulation Analysis of the Solar Car X.Z. Liu, H.M. Wang, F. Zhang, Y.L. Zhang and Q.C. Liu	14
The Application of Reverse Engineering in the Mould Injection Parts Y.X. Xie	19
The Research of Equal Probability Newton Iterative Method to Mechanism Synthesis & Approximate Synthesis X.Y. Che, Y.X. Luo and L.F. Li	24
Calculation and Simulation Azimuth Hydrostatic Thrust Bearing of a Large Alt-Azimuth Telescope L. Huang, W.L. Ma and J.L. Huang	28
The Hydraulic System Improvement of Copper Ingot Hot Rolling Equipment Based on Energy-Saving J.J. Wang, S.L. Hao and L. Pan	33
The Wear Behavior of Shots Impeller Pair in Shot Blast Cleaning L.H. Song, S.R. Wang, Y.Z. Wang, P.L. Song and G.J. Xue	37
Dynamic Analysis and Structure Optimization of Linear Vibration Screen Y.Y. Wang, X.L. Liu, W.B. Wei and N. Qin	42
Hydrostatic Support Design of Cooling Copper Roller with Inner Pressure Feedback in Forming Amorphous Ribbon Y.M. Song and Y. Yang	46
Shear Strength and Failure Angle Analysis of Fillet Welds Based on Structural Stress Approach C.G. Nie, W.Z. Zhao and Y.D. Wang	52
Study of the Knife-Gap Adjustment for Rolling-Cut Bilateral Shear Y.B. Zhang, D.Z. Zhang and M. Jin	57
The Research on Information Fusion Methods of Leakage Failure Mode Identification of Hydraulic Cylinder X.X. Zhao, C.L. Zhou, Z.M. Hu and W.B. Zhang	61
Study on the Effect of Cone Diameter on the Flow Characteristic of Hydraulic Poppet Valve J.Y. Shi	66
Analysis of Eccentric Load Effect for Tilting Pad Journal Bearing M.H. Yin, G.D. Chen and G.Y. Zhang	71
The Optimization Analysis of the Lifting Structure of the Buried Garbage Compression Station M.Q. Zhong, H.B. Xiao, Q. Huang, H.Z. Wang and Y.X. Ye	76
New Type Homogenizing Valve: Flow Patterns Simulation B. Liu, X. Wu, J. Wang and T. Feng	81
The Precision Horizontal Machining Center Integrated Dynamic Accuracy Modeling Based on Multi-Body System Theory L.G. Cai, C.M. Xiao, Q. Cheng, Z.F. Liu and P.H. Gu	87
Research on Engine Cranking Process in Downhill Braking Condition for an Electric Drive Underground Dump Truck S.Y. Zheng and C. Jin	92

The Analysis of Bearing Life of Drive Gear Box of NC Gear Shaping Machine Based on Romax	
Y.Q. Chen, L. Xu and X.H. Xu	97
Dynamic Analysis for Wind Turbine Composite Blade	
L.Q. Zhou, S.H. Xing and Y.P. Li	102
Inverse Kinematics and Dynamics Simulation of a Dredging Clamshell	
Q. Xiong and H.B. Xiao	107
Short-Term Wind Power Prediction Based on Phase Space Reconstruction Theory	
Z.G. Li, L.L. Li, J.H. Li and S.N. Zhang	112
Analysis of Aerodynamics Behavior of FGM Cylindrical Panel	
L. Yang and Y.X. Hao	118
Mechanics Modeling for Bearing Rigid-Flexible Coupling Multi-Body System Based on ADAMS	
J.W. Zhen, L.L. Cui and X. Chen	124
Innovation Design of the Multi-Operational CNC Lathe Based on TRIZ Theory	
Y. Jin and S.J. Liu	129
The Study of Automotive Aluminum Alloy Radiator Tank's Leakage	
J. Gu, X.F. Yang, T. Ma, Z.S. Feng, L. Li and C.L. Liu	134
The Nonlinear Vibration Characteristics of Gear Swing System of Overload Swing Angle Milling Head	
W.T. Yang, S.T. Yang, T.N. Guo, Z.F. Liu and L.G. Cai	138
The CFD Analysis of JQ40A Gasoline Turbocharger Compressor	
M.X. Liu	144
Finite Element Analysis of Bullet Penetration Circular Sandwich Plate	
P.L. Zhao, F.Z. Song, N.J. Chen and B. Song	149
Analysis of the Adhesive-Bonded Joint Stress in a MW Segmented Assembly Wind Turbine Blade	
L. Liu, G.Y. Li, J. Sun and Q.B. Liu	154
Test and Analysis of Machine Center's Principal Spindle Thermal Characteristics	
J.F. Lin, K. Liu, Z. Tan and Y.L. Wu	159
Test and Analysis of Machine Center's Principal Spindle Dynamic Errors	
K. Liu, C.S. Liu, Z. Tan and S. Zhou	163
Evaluation of the Uncertainty in Constant Speed Fuel Consumption Test	
J. Tong and J. Zhao	167
Numerical Simulation and Experimental Study on Fluid-Filled Hemispherical Shell under Impact	
H.W. Yang, B. Qin, Z.J. Han and G.Y. Lu	172

Chapter 2: Applied Computational Methods and Algorithms

An Adaptive Threshold Algorithm Based on Satisfactory Filtering Principle	
L.F. Gou and B.J. Han	179
Research on Public Transportation Based on Complex Network and Multi-Agent Simulation	
S. Liu, S.H. Dong and Q.H. An	183
Grey New Information GRM(1,1) Model and its Application Based on Reciprocal Accumulated Generating and Background Value Optimization	
Y.H. Cai, W.Y. Xiao and B. Zeng	188
Pseudo Two-Hop Distributed Consensus Algorithm with Time-Delay	
H.X. Peng, B. Liu and D.H. Xu	192
Stability Prediction on Mathieu Equation of Delayed Periodic Term Based on Full-Discretization Method	
L. Meng, M.Z. Li, S.J. Li and Y.L. Zhang	197
An Improved Gray Similarity Degree with Adaptive Weight for Guidance Simulation Credibility Evaluation	
F. Wang and X.G. Liang	202

Grey New Information GOM(1,1) Model Based on Opposite-Direction Accumulated Generating and its Application X.Y. Che, Y.X. Luo and Z.M. He	207
The Computation of Azimuth and the Shortest Path between Two Points on the Earth's Surface T.T. Huang, J.C. Quan, X.Y. Zhao, X.S. Song, R. Xiao and B. Yu	211
Complex Equipment FMECA Method and Application Based on the Product Family Y.L. Qiu, Z.Y. Wang and Q.H. Cui	216

Chapter 3: Sensors, MEMS and Microengineering

Researches of the Differential Fiber Bragg Grating Seepage Pressure Sensor B. He, D.L. Li, C. Li, Y.N. Li and Y.P. Zhou	223
Development and Implementation of a Novel Digital Shot Sensor System W.T. Wang, Q.J. Song, Y.M. Nie, B.Y. Wang, H.Y. Ren and Y.J. Ge	228
Modeling of CH₄ Adsorption-Induced Curvature of a Nanocantilever B. Li and Q.A. Huang	233
Computer Simulation Analysis of Microchannel for a Continuous-Flow PCR Chip C.W. Young, C.C. Lien, C. Ay and P.C. Pan	238
Fabrication of Micro Cylindrical Electrode with Flat End Shape and its Application in Electrochemical Micromachining Y. Liu	244
<i>In Situ</i> Measurement of Elastic Modulus of Individual Layers for Composite Thin Films by MEMS Test Structures C. Sun, Z.F. Zhou, W.H. Li and Q.A. Huang	248
Design and Analysis of Force Sensor for Condition Monitoring System of Ball Cold Heading Forming Q. Zhang, Y.J. Li, R.J. Ma and X.H. Men	253
The Application Design of Inductance Sensor in Active Magnetic Bearing W.T. Yu, H.W. Li, S.Q. Liu and Y.P. Zhang	257
A Novel RFID-Based Thermal Convection Accelerometer with Heater and Thermal Piles Deposited by E-Gun Focused on Mixing Powders of Metals J.M. Lin and C.H. Lin	262
The Position Plane Distortion Study of 2-DOF Precision Position Table X.M. Feng, L.S. Li, Z.D. Liu and D.W. Zhang	267

Chapter 4: Industrial Automation and Process Control

The Design of Active Noise Control System in Power Transformer C.M. Pei, J.T. Liu, Z.Y. Liu and L.M. Ying	275
Research and Design of Simple Numerical Control System of Valve Block Processing E.T. Zhou, J.Z. Lin, L. Tao, X.L. Chen and C. Song	280
Kinematical Analysis and Simulation of Stamping Processing Complete Set of Control Line System Based on ADAMS K. Wang and J.P. Zhou	285
Research on Gap Adjustment for Offset Printing Machine Based on ARM Z.Q. Gao and H.X. Sun	290
GPC Control on Exhaust Gas in Regenerative Furnace Based on Feedforward of Hearth Temperature and Air Flow X.G. Sun and Z.G. Zhou	294
Research of Steer-by-Wire Technology on Articulated Wheel Loader A.M. Wang, M. Tang and J.Y. Li	299
A Flexible Chain Conveying System with Workpiece Model Marking G.D. Yuan and C.Y. Li	304
Analysis and Restraining of Electro-Magnetic Interference for Thyristor Based DC Motor Drives H.M. Huang, Z.J. Zhang and W.S. Chou	309

Research on Shape Signal Smoothing Processing of Cold Rolling Strip L.P. Yang and B.Q. Yu	314
Research on the Integrated Control System of a Small Marine Condenser Y.S. Zhang, X.C. Peng, R. Ma and W.M. Fang	319
Research on Automatic Exchange of Mill Heads of Movable Beam Type Machining Center G.J. Cao, Y.Q. Kong, J. Liu and J.F. Ni	324
Transformation Design of Mixed Injection Molding Production Line X.E. Zhou, F. Luo, X.Y. Deng and F.J. Che	329
Research of a General Method for the Data Migration in Cutting Parameters Database of Industry-Oriented Applications D. Wang, Q. Liu and S.M. Yuan	333

Chapter 5: Robotics

Marker-Based Target Location and Recognition for Visual Robot W.L. Xu and G.H. Chen	341
Numerical Simulation of Bionic Locomotor Batoid with Combined Frequency Undulating Pectoral Fins Z.J. Wu, W.S. Chen, S.J. Shi and D. Xia	346
Robot Flocking Control with Part Information of the Virtual Leader H.X. Peng, B. Liu and D.H. Xu	352
New Type of Disaster Rescue Robot J.G. Feng, S.L. Wang, S. Yuan and C.Y. Bian	357
Design of Biped Walking Robot Based on the Arduino J. Liu and T. Wu	361
Design and Simulation Analysis of the Manipulator Used to Feed Gems X.L. Deng and H.B. Wei	365
A Novel Autonomous Docking Method of Unmanned Marine Vehicle Based on Manipulator J.L. Chen, Y. Dai, Z.Q. Zheng, Z.Y. Chang, W. Dai, Z.W. Wen and X.L. Zhao	370
Developments in Research on Seedling Auto-Picking Device of Vegetable Transplanter X. Jin, S.J. Li, X.J. Yang, J.M. Wu, Z.J. Liu and H.K. Liu	375
Kinematics Simulation of 3-RPS Parallel Mechanisms Based on Virtual Reality Y. Tang, J. Liu, L.H. Li and X.D. Liang	380
A New Compensation Method for Multi-Choice of a Five-Axis Machine with a Tilting Head C.H. Yin, H.J. Jing, N.D. Huang and F. Ren	386
Improved Algorithm for the Circular Interpolation Time Division Method in CNC System X.D. Yao and X.T. Zhao	391
Dynamics Simulation Analysis of Exchange Cutter Manipulator Based on RecurDyn Q.C. Ma, T. Fang, Z.X. Fang and A.G. Lu	396
Development and Analysis of a Thermal Tracking System C.C. Lien, W.T. Liu and J.L. Lin	401

Chapter 6: Applied Information Technologies, Electronics and Communication Technologies

Development of Remote Education and Training Based on Internet of Hydropower Plant T. Chen, Q.J. Chen, C. Chen and L.L. Qiao	409
Research on Design Knowledge Retrieval Based on Matlab and VB Language W.W. Liu and S.Y. Shen	414
Remote Multi-Processor Updating System Based on In-System Programming and CAN-Bus S.B. Qi, M. Zhang and Z.H. Wang	419
Monitoring System of Greenhouse Based on GPRS Wireless Communication Technology M.J. Liu, X.R. Dong and Y.Z. Ma	424
Design of a 0.7~3.8GHz Wideband Power Amplifier in 0.18-μm CMOS Process Z.Y. Li and X.N. Fan	429

A Wideband 9 GHz LC-VCO with Tail Current Source Array in 0.18-μm RF CMOS Process	434
P. Ma and X.N. Fan	
Design of Broadband, High-Speed Dual-Modulus Prescaler for Multi-Mode PLL Frequency Synthesizer	439
X.F. Jiang and X.N. Fan	
A 1V Low Voltage 4GHz Phase-Switching Dual-Modulus Prescaler in 0.18μm CMOS	444
L. Yuan and X.N. Fan	
The Simulation and Application in Eliminating Noise of Adaptive Filter	449
F.Q. Xiong and B.Q. Ao	
Design and Preparation Method of Fiber Optoacoustic Effect Device Used for Artificial Optical Cochlea	453
C. Li, J.X. Wang and L. Tian	
Design of an Active-Gm-RC Reconfigurable Filter for the Multi-Mode Receiver	458
L. Qian and X.N. Fan	

Chapter 7: Advanced Manufacturing Technologies

Simulation Analysis of Cutting Resistance for Cutting Tools with Different Rakes in the Strike Working Condition	465
J.L. Wang, D. Wang and J.H. Liu	
Progress of Theoretical Research-Oriented Multi-Species Small Batch Machining Process	470
M.Y. Yue and Y.D. Zhou	
Technological Process Optimization of Hot-Machining Numerical Simulation	474
Y.P. Huang, M.T. Ma, F.P. Ning and R.F. Chen	
Simulation of Induction Quenching on the Work Area of Reading Arm in Electronic Dobby Shedding Device	478
Z.L. Li, R.F. Chen, H.F. Lu, L. Wu, H. Yang, Q.Q. Li, Y. Pan and T. Liu	
Study on the Effects of the Indirect Liquid Forging Die Life	483
L. Li, L.M. Tian and N. Zhao	
Upsetting Process Analysis and Numerical Simulation of Metal Pipe's End	488
Y.L. Su, W.Z. Yang and C.P. Wang	
Precision Forging Process Analysis and Preform Optimization of Small Compressor Blade of Titanium Alloy	493
W.C. Xu, D.B. Shan, W.F. Zhang and Y. Lu	
Mathematical Model Establishment of Prefabricated Hole Flange-Forming of Unequal Diameter Tee Pipe	500
Z.L. Wang, Z.D. Li and X.K. Zhang	
Multi-Objective Technologic Parameter Optimization of Face Milling Based on GRA-PSO Algorithm	504
D.H. Tang and Y. Han	
Testing Study on Surface Grinding of Post-High-Temperature Granite	509
J.G. Yang, Z.Y. Zhao and S.Z. Zhang	
A Hybrid Approach Based on the Fuzzy AHP and Benefit Cost Analysis to Evaluating Cutting Blade Alternatives	513
C.W. Xu, J. Yao and J. Li	
Research on Stretching Efficiency of Heavy Forged Shaft Based on Orthogonal Experimental Design	519
Q.X. Xia, G.F. Xiao, Y.L. Huo and A.S. Song	
Optimal Design of Heating and Ventilation for Drying Room Based on Transient CFD Simulation	524
S. Huang, T.T. Ding, C. Yan and Z.S. Wang	
Prediction of EVA Plastic's Expansion Ratio Based on BP Neural Network	529
L.F. Zhu, B. Liu and J.W. Xu	

Chapter 8: Alloys, Steel Materials and Metallurgical Technologies

Study of Martensitic Transformation Temperatures of Ferromagnetic Shape Memory NiMnGa Alloys G.Z. Song and D. Zhang	537
Experimental and Simulation Research on Stamping Formability of Hot-Dip Galvanized Sheet L.G. Wang, T. Zhou and Y. Huang	542
Numerical Analysis of Irradiation Effects on Metal Materials of Fusion Reactor F. Liu and L. Zhang	547
Properties of Porous FeAl Manufactured from Ball Milled Fe/Al Elemental Powders by Two-Step Sintering J.L. Liu, Y.Z. He, H. Xu and X.Y. Ye	553
Effective, Controlled Method to Add Sulfur into Molten Steel to Produce Free Cutting Steel for Automobile T.J. Zhang	558
Research on Fuzzy Random Reliability Based on Partial Least-Squares Regression Model Y.F. Zhang, Z.J. Sun and Y. Liu	563
Non-Equilibrium Statistical Theory of Void Microstructure Evolution in Irradiated Metals X.H. Guo and H.Y. Hu	568
Effect of Li on Corrosion Resistance of Nearly Eutectic Al-Si Casting Alloys Y.X. Cai, Z.K. Zhao and Z.G. Wang	573
Influence of Sizing and Cooling Process on Properties of N80-1 Seamless Casing Using Steel 40Mn2V and the Process Parameter Control L.S. Wu, J. Fang, M.X. Li and Z.X. Yuan	577
LJ707-Crnimo Flux Cored Wire of Basic Slag System Be Applied to Non-Preheating Welding Technology of HSLA T.G. Hurile, F.R. Chen, Y.F. Hao and A.A. Zhang	584
Effect of Isothermal-Rolling Process on the Morphology, Size and Distribution of Type II MnS Y.J. Xia, D.D. Fan, S.J. Wang, J. Li and Y.L. He	589
Application of Temperature Forecasting in Cupola Melting Process Based on BP Neural Network X.Y. Sun, J.X. Zhou, L. Sun and H. Wang	594
Study on Corrosion Electrochemical Behavior of X42 and 16Mn Steel in Seawater B.G. Li, X.H. Tong, Y. Liu, Y.G. Wang and L.S. Zhu	599
Numerical Analysis of Temperature Field of Co-Based Alloy Coatings by Laser Cladding on the Mild Steel L. Ding, M.X. Li, X.C. Zhu and H.Y. Jiang	603
Study on the Microstructure and Oxidation Properties of near Eutectic Nb-Si Alloys Y.J. Jiang	609
Thermal Kinetics Phase Field Model for the Metals' Solidification - Mathematic Derivation of the Dendrite Growth Phase Field Variable Diffusion Model H.M. Ding and L.C. Pu	614
Research on the Process Parameters of W-Mo-Dy Co-Diffusion by Plasma W.Q. Wu, Y. Gao, Y. Zhang, W. Zhang, C.L. Wang, Z.K. Ma and H.W. Cai	619

Chapter 9: Chemical Materials and Chemical Engineering

Preparation of Waterborne Epoxy Resin Emulsion R.Z. Hao, F.Y. Yun and J.L. Xiao	627
The Monolithic Silica Aerogel Derived from MTMS/TEOS Y.X. Yu and Y. Chen	631
Thermal Decomposition Mechanism of 2-Nitroimino-5-Nitro-Hexahydro-1,3,5-Triazine (NNHT) Y.H. Ren, F.Q. Zhao, W. Li, J.H. Yi, J.R. Song and X.H. Wang	635
Study on HPAM Biodegradation in the Wastewater of an Oilfield Q.G. Chen, M.T. Bao and M. Liu	640

Development of Automatic Hot-Water Insulation System for the Weaned Piglets of Nursery Using Biogas-Combustion	
C.C. Lien, J.H. Mei and P.K. Lei	645
Research on the Preparation of Low Water Zinc Borate	
Z.M. Chen, X.C. Jiao, J.Z. Xu and L.G. Che	650
The Effect of Modification of Hydroxyapatite Whisker with Zinc Acetate via Sol-Gel Technology	
J.F. Jin, W.Y. Liu, W.Y. Zhang, Q.H. Chen, Y.B. Yuan, L.D. Yang, Y.H. Xiao and M.Q. Li	655
Research on Dyeing and Finishing Technology of Polylactic Acid Fiber	
Z.J. Fu, H.F. Huang, L.S. Yu and H. Wang	660
Synthesis and Application Research of op-10/ Cationic Surfactant Composite Asphalt Emulsifier	
S.R. Jin, K. Zhang, J.X. Pang and S.S. Song	664
Pressure Adaptive Feeding System Based on Piston Extrusion	
Y. Liu, Y.Z. Yu, Y.Y. Liu and Q.X. Hu	669
The Fabrication of Self-Assembled Film on Steel Surface	
Z.M. Chen, X.C. Jiao, X. Zhou and S.H. Wang	674
ATRP Synthesis of PS-b-PtBMA and Preparation of Porous Film	
C.H. Yan, Z.J. Zhang, H.Y. Chen, Z.Y. Xie, T. Zhu and M. Zhang	679

Chapter 10: Composite Materials and Technologies

Effect of Modification of Aluminum Borate Whiskers with Three Methods on Flexural Properties of Dental Resin Composites	
Y.B. Yuan, X.X. Li, W.Y. Zhang, Q.H. Chen, Y.H. Xiao and L.D. Yang	687
Studies on High Strain Point Aluminosilicate Glasses	
Y.L. Tian, J.S. Cheng, L. Zhang, S.B. Sun and J. Zhang	692
Tread Rubber Material Oxidation Experiment and Influence on Tire Performance	
Y.S. Wang, Z.B. Cui, Q. Liu and J. Wang	696
Preparation of Sulfonated Cyclohexanone-Formaldehyde Resin	
H.X. Guo, Q. Liu, Z.M. Wang and S.P. Cui	701
Study of Surface Characteristics of T700 Carbon Fibers and Interfacial Properties of their Reinforced Epoxy Composites	
L.C. Li, L.L. Wang, H. Hao, H. Ling, H.J. Sun, Y.H. Yu and X.P. Yang	706
Fabrication Processing and Tribological Properties of Al₂O₃/TiFeCrWMoV Based High Temperature Self-Lubrication Composites	
Y. Han, Y.J. Wang and S.R. Wang	711
Modification of PP by Using Recycled Materials	
A. Xie, H.L. Jin and M. Zhang	716
Research on the Process of (Ti,Cr)N by Multi-Arc Ion Plating and Microstructure of Composite Films	
Y. Zhang, Y. Gao, W.Q. Wu, L. Yuan, C.L. Wang, Z.K. Ma and H.W. Cai	721
Investigation on Fabrication of Glass Fiber Reinforced Polypropylene by Recycled FRTP and their Properties	
J.L. Ma, H.L. Jin, Z.B. Cao, S.D. Wang, J.L. Liu, C.H. Yan and M. Zhang	727

Chapter 11: Nanomaterials and Nanotechnologies

Two-Step Fabrication of Nano-PbS on Peacock Feathers Inspired by a Hair-Dyeing Method Used in Ancient Egypt	
X.W. Liu, J.J. Gu and F.Y. Zhang	737
A Study on Early Apoptosis of Hepatoma Bel-7402 Cells <i>In Vitro</i> Treated by Altering-Electric Magnetic Field Exposure of Extremely Low Frequency Combined with Magnetic Nano-Fe₃O₄ Powders	
Z.Q. Chen, J. Wen, W.Y. Tu, L. Xiao and Z. Fang	742
The Assembly of Nanowires by Dielectrophoresis	
J. Zeng, Z.Z. Wu, Y. Peng and M. Liu	749

Micromechanics Model for Nanovoid Growth in Nanocrystalline Materials J.Q. Zhou, L. Wang and Z.X. Ye	754
BST Nano-Powder for Infrared Detector Prepared by Sol-Gel Method M.Y. Fan and L.F. Zhang	760
Computational Study on Cu Clusters Supported on Au(010) Surfaces at Atom Scale D. Zhang and L. Zhang	765

Chapter 12: Ceramics and Functional Materials

Dynamic Mechanical Properties of a Novel Structural Radar Absorbing Materials J.L. Zhao, L.X. Li and Z.J. Yang	771
Study on Attenuation Performance of Expanded Graphite at 8 mm Wave under Different Experiment Conditions M.H. Pang, X.Y. Wang, W.J. Dong and H.T. Bai	775
Improved Antireflection Property of Subwavelength Structures Based on Finite Difference Time Domain Method C.F. Chen, Y.C. Cheng and C.J. Ting	780
Research on Attenuation Law of Expandable Graphite to Millimeter Wave in the Three-Dimensional Space H.T. Bai, X.Y. Wang, W.J. Dong and M.H. Pang	785
Solutions and Experimental Verification of Recycling of Micaboard Leftover Materials J.W. Cheng and G.K. Zhang	790
Electrical Properties of Bi(In,Ga,Sc)O₃-PbTiO₃ Piezoelectric Ceramics Y. Chen, J.G. Zhu and D.Q. Xiao	794
Effect of Surface Modification on Slip Casting of SiC Slurry C.H. Zheng and X.L. Ji	799
Membrane System Processes of Edible Gelatin Film F. Xue, Y.S. Jiang, Y.C. Han and C.J. Wang	804
Response Frequency Characteristic under Loop Stress for the Material Deposited NiTi SMA Thin Film on PZT Substrate Q.S. Liu, C.M. Lu, L.J. Yuan and W.W. Yang	809

Chapter 13: Other Related Topics

Industrial Design and Engineering Analysis of Multi-Function Bicycle on Children Factors X.L. Wu, Y.X. Wang and Y.Y. Yao	817
Product Integrated Design Knowledge Modeling for Multidisciplinary Design Optimization System H.Q. Liu and M. Lv	822
Studies on Classification Performance Assessment of a Dry Classifier Based on Analytical Hierarchy Process Y. Yu and J.X. Liu	828
Research for Scale Effect Based on Similarity Theory A.L. Wang and C. Zhu	833
A Model of Human Cone Based on Physiological Distribution F.L. Duan and Z.J. Wang	838
Study on Evaluation Method of High-Speed Train Based on Bipartite Graph L.X. Li, Y.Y. Ma and Z.L. Liu	843
Cognitive Stratified Model on Misperception in Human-Computer Interaction X.L. Wu	849
Recovery Techniques for Complex Grain Boundaries C.M. Sun	854
Research and Development on Materials Management System of Foundry ERP H. Wang, J.X. Zhou, X.Y. Ji and H.T. Tang	859