Research on Mechanics, Dynamic Systems and Material Engineering

Selected, peer reviewed papers from the 2012 International Conference on Mechanics, Dynamic Systems and Material Engineering (MDSME2012), November 24-25, 2012, Guangzhou

von B. Xu, H.Y. Li

1. Auflage

Research on Mechanics, Dynamic Systems and Material Engineering – Xu / Li schnell und portofrei erhältlich bei beck-shop.de DIE FACHBUCHHANDLUNG

Thematische Gliederung:

Werkstoffkunde, Mechanische Technologie

Trans Tech Publications 2013

Verlag C.H. Beck im Internet: <u>www.beck.de</u> ISBN 978 3 03785 569 0

Table of Contents

Preface, Committees and Sponsors

Chapter 1: Research on Mechanics and Dynamics of Systems in Mechanical Engineering

Dynamic Simulation of the Movement of the Rocket Launch Tower on ADAMS Based on

the Material of the Tower J. Zhou, J.S. Ma, Z.X. Sun and C.G. Wu	3
A Simple Method for Calculating the Bending Modal Frequencies of an Underwater Simply Supported Beam with Hydrodynamic Study R. Tang, D.J. Shang and Q. Li	7
Study on the Basic Problems of Dynamics by Induction and Generalization Z.Q. Xu and K.G. Qian	12
Nonlinear Vibration of Functionally Graded Material Cylindrical Shell Based on Reddy's Third-Order Plates and Shells Theory L. Dong, Y.X. Hao, J.H. Wang and L. Yang	18
Experimental and Finite Element Study on Mechanical Behavior of Bolted Joint with Bolt Clearance in Transmission Tower B.R. Zhu, H.J. Xing and J.B. Yang	25
Mechanical Analysis on the Splicing Form of Cross-Section Multiple Angle Steel for Transmission Line Y. Gao, J.K. Han and Q.H. Li	30
Dynamic System of a Mechanical Press Driven by SRM for Flexible Process W.F. Shang	37
Numerical Simulation of Water Removal Process in the Microstructure of Gas Diffusion Layer with Mechanics Properties and Material Properties C. Sun, Q. Du, Y. Yin and B. Jia	41
Study on Optimization of Dynamic Characteristics of Turbo Generator Foundation Y.H. Sun and Q. Zhang	45
Three-Dimensional Simulation of Water Droplet Movement in PEM Fuel Cell Flow Channels with Fluid-Mechanics Properties and Different Deformations of GDL N. Bao, Q. Du and Y. Yin	53
Study on some Aspects of Breakup Characteristics of Power-Law Fluid with Impinging Jets Based on Mechanics Properties E.D. Wang, Y. Yin and Q. Du	57
Analysis of Dynamic Behavior of Ultra-High Voltage Porcelain Arresters with New Type Lead Dampers X.S. Zhang, Z.B. Dai, Z.C. Lu and C.C. Cui	61
Crashworthiness Analysis and Optimization of Thin-Walled Square Tube with Pyramidal Ripples Based on Mechanics Properties X.G. Hu and J.B. Yang	69
Dynamic Characteristics Simulation of the Digital Hydraulic Cylinder Based on AMESim X.S. Guo, Q.C. Li and J.L. Xiao	75
Study on Building Seismic Design Based on Mechanics Properties with Economical Assessment M. Zhong and W. Ji	79
Effects of the Launch Speed on Hydrodynamic Force of the Underwater Vehicle Vertical Launch with the Gas Curtain H.J. Liu, X.Z. Peng and Z.Z. Zou	84
Graphic Method for Design of Eccentric Slider-Crank Mechanism and Analyzing of Feasible Region	
C.Z. Hao, S.H. Ma, G.X. Cai, J.G. Yu and Z.N. Jia Analysis and Optimization of Level-I Vibration Absorption of Single Drum Vibratory Roller	88
X.B. Zhang, D.W. Zhang and Z.X. Feng	93

Trajectory Planning and Prediction Guidance Based on the Moon-Earth Return Reentry Dynamics	
B. Zhao, N.G. Cui, J.F. Guo and P. Wang	100
Numerical Simulation of Sphere Impacting Water by SPH with Hydrodynamics Q.L. Qu, J.L. Wu, B.D. Guo and Y.P. Qin	104
Reentry Trajectory Planning Based on the Secondary Reversal Dynamics for the Second Generation Reusable Launch Vehicles B. Zhao, N.G. Cui, J.F. Guo and Y. Fu	109
Hydrocyclone Velocity Flow Simulation and Experimental Study Based on Fluid Mechanics H. Xu, X.H. Chen and Y. Yao	113
Hydrocyclone Two Phase Flow Experimental Research Based on Fluid Mechanics H. Xu and X.H. Chen	117
Vibration Reduction by Optimal Design of Powertrain Mounting System of Heavy Truck Based on SQP Method H. Jing, C. Li, F.Y. Liu and B. Kuang	121
Roller Element Bearing of Mine Ventilating Fan with Fault Diagnosis Based on Mechanics Properties and RBF Neural Network Y.H. Zhang, C. Li, H. Jing and B.B. Gao	125
Application Study of the Vehicle's Steering System with Mechanical Mechanics L.Q. Meng and Z.W. Wang	130
Research on the Initial Disturbance of Vehicular Missile with System Vibration Analysis C. Zhang and Y. Jiang	134
Launching Dynamics Simulation of Ship-Board Rocket Gun W. Zeng and Y. Jiang	140
Kinematic Analysis and Simulation of an A/C Axes Bi-Rotary Milling Head with Zero Transmission	
Y. Chen, M.F. Huang, B. Shi, M.M. Xiao, R.K. Hu and J.S. Tang	146
Dynamics and Trajectory Tracking of a Spherical Rolling Robot on an Inclined Plane T. Yu, H.X. Sun, Q.X. Jia, Y.H. Zhang and W. Zhao	151
The Motion Simulation and Analysis of Reinforced Flip Device Based on UG NX7.5 J. Sun, W. Zhu, H.L. Tang, L. Tian and W. Liu	155
Heat Design of Multi-Functional Structure of Electronic Equipment with Material Properties in Control System	4.50
J.H. Wu, Q. Zhou, Q. Zhou, J. Chen, H.P. Si, K.Y. Lin and C.B. Zhang	159
The Finite Element Thermal Analysis for Lubricating Oil Transfer Pump in Different Convection Heat Transfer Coefficient with Special Material Properties J.N. Xu, W. Lv, W.J. Lv and D.Y. Zhu	167
3.11. 21d, 11. D1, 11. 3. D1 tild D. 1. 2.1d	107
Chapter 2: Research on Material Engineering and Material Applications	
Microstructure and Mechanical Properties Analysis of AL-5052 Self-Pierce Riveting Joint	
in Material Application Engineering J.N. Xu, X.C. He, Y. Tang, Y.F. Ding, Y.B. Hu and K. Zeng	173
Effect of Activated Carbon Materials' Surface Texture Parameters on Separation Factor for Coal Mine Methane	
X. Yang, Y.S. Liu and Y.L. Li	177
Preparation of Silver Doped PMN-PZT Ceramics and Their Energy and Materials Engineering Applications J.C. Kang and G.P. Zheng	181
Spectral Properties of the Optoelectronic Material Rhenium (I) Tricarbonyl Complexes with Bipyridine Ligand Containing Triphenylamine Moiety	
H.Y. Xia and F. Zhao A Study on Preparation Methods of LiNi _{0.5} Mn _{0.5} O ₂ Cathode Materials	185
F.R. Lang	189
Optimization of Sanding Parameters for Wood Surface of Plantation-Magnoliaceae glanca Blume	
X.B. Li, J.D. Huang, C.W. Su, J.J. Luo and L. Lai	193

Effects of Surfactant Agent and PTFE Content on Surface Morphology and Microstructure of Ni-P-PTFE Composite Coating	
C.Q. Fu, X. He and Ž. Wang	198
The Status and Analysis of the Equipment for Fine Mineral Particle Classification in Coal Wash Plants J. Ma, S.H. Zou, X.Z. Wang, B. Hui, X.D. Liu, S.J. Chen, Y.N. Li and H.F. Chen	202
Specific Rebinding of Protein Imprinted Calcium Polyacrylate/Alginate Hybrid Materials	202
via the Adjustment of pH Values W.K. Cui, K.Y. Zhao, J.F. Wei and G.X. Cheng	206
Concentrating Elastic Waves by Isotropic Homogeneous and Reflectionless Materials J. Hu and X.Y. Lu	210
Mechanical Properties, Morphology and IR Analysis of the Proban CC-Treated Celluloses S.F. Li, J.Y. Liu and B.W. Cheng	214
Effects of Different Carbon Sources on Performance of LiFePO ₄ /C Composite Material C. Yang, Y.M. Li, S. Liu and Y.C. Yao	218
Preparation and Magnetic Properties of Nanocrystalline (Fe,Cr)-N W.J. Feng, C.Y. Wang and H.H. Zhang	222
Numerical Simulation of Transient Response of Inlet Relative Humidity for High Temperature PEM Fuel Cells with Material Properties X.L. Chen, B. Jia, Y. Yin and Q. Du	226
Electronic Structure and Optical Properties of SiC Nanotube Material with Silicon Antisite Defect	
K.J. Li, J.X. Song and H.X. Liu	230
Analysis of Voltage Losses in High Temperature Proton Exchange Membrane Fuel Cells with Properties of Membrane Materials and Fluent Software X.L. Yang, Y. Yin, B. Jia and Q. Du	235
Surface Morphology Studies on PBI Membrane Materials of High Temperature for Proton	
Exchange Membrane Fuel Cells Z.Y. Zhai, Y.G. Shen, B. Jia and Y. Yin	239
The Carbon Deposition during Iron Ore Reduction in Carbon Monoxide S.H. Geng, W.Z. Ding, S.Q. Guo and X.G. Lu	243
Comprehensive Utilization of Oil Shale with Analysis of Material Properties Z.Y. Yuan	247
Ni Doped LiMn₂O₄ Prepared by a Flameless Combustion Synthesis G.Y. Liu, B.S. Wang, Y. He and J.M. Guo	251
Phase Structures of LiMn _{1.95} Fe _{0.05} O ₄ Prepared by Solution Combustion Synthesis and Molten-Salt Combustion Synthesis Methods G.Y. Liu, B.S. Wang, Y. He and J.M. Guo	255
Sn-Ni Nano Particle Prepared by a Chemical Reduction Method	233
G.Y. Liu, Z.L. Huang, Z.Z. Yi, L.D. Sun and H.Y. Sun	259
Influence of Carbon Doping on Microstructure and Tribological Properties of CrN Coating P.F. Hu, G.J. Yin and S.K. Zhou	263
Synthesis and Characterization of ZnS Nanoparticles by Using Polyvinylpyrrolidone as Stabilizer X.H. Fan, H.J. Liu, Y.M. Chen and T. Sun	269
Preparation of a Hydrophilic PVDF Membranes by Electron Beam Induced Grafting	209
Polymerization of Acrylic Acid L. Yang, J.F. Wei, K.Y. Zhao and Z.A. Luo	273
Optical Energy Gap and Microhardness of Cu ₃ N Thin Films X.M. Yuan, T. Liu, X.H. Zhang and P.X. Yan	277
Thermal Design, Analysis and Verification of Chip-Level MCM with Properties of	
Semiconductor Materials J.H. Wu, Q. Zhou, Q. Zhou, J. Chen, H.P. Si, K.Y. Lin and C.B. Zhang	280
Fabrication of High-Quality CuInSe ₂ Films by Coating, Compaction and Selenization J.G. Xu, Y.L. Wang and H.B. Nie	287
The Experimental Study of Diffraction Angle of Aluminum Alloy 3003 N.O. Duan, J.L. Ren and R.O. Pang	291
	/.7

Treatment Effect of Coking Wastewater Using Three-Phase Biological Fluid-Bed with New Ultrastructure Biological Carriers Based on Properties of Biological Materials N. Li, H.B. Liu and J.L. Huang	297
Characterization and Properties of CrTiN Films T. Liu, X.H. Zhang, X.M. Yuan, X.H. Zheng and G.A. Zhang	301
Microstructure and Mechanical Properties of Mo ₂ FeB ₂ Based Cermets Containing SiC Whisker H.Z. Yu, W.J. Liu, L. Ying and M. You	304
Thermal Performance Analyses of Heat Pipe of All-Glass Evacuated Tubular Solar Collectors with Properties of Pipe Materials W.B. Chen and L.X. Zhang	308
Determination of Stress-Strain Constitutive Relation of Echelle Grating Al Film by Nanoindentation Test and Simulation G.F. Shi, G.Q. Shi, L.S. Song and Z.W. Xu	312
The Effects of Diffusion and Temperature-Dependent Properties on Generalized Thermoelastic Behaviors in Thermal Dynamics Y.P. Liu and S.H. Shi	318
Mechanical Performance of Ti/Cu-8Ag/S20C Clad Composite Processed by High Pressure Torsioning (HPT) J.Y. Song, J.S. Ha, I.K. Kim and S.I. Hong	323
Suitable Hydrogen Pressure Induced Anisotropy in HDDR-Treated Pr-Fe-B Powders G.B. Han, S. Fu, M. Liu and R.W. Gao	328