

# Table of Contents

## Preface and Organizing Committee

## Chapter 1: Material Science and Chemical Engineering

### **The Influence of Sulfurization Time and H<sub>2</sub>S Concentration on the Properties of Cu<sub>2</sub>ZnSnS<sub>4</sub> Thin Films**

M. Xie, D.M. Zhuang, M. Zhao, B.J. Li and J. Song 3

### **Research of Superplasticity Deformation Behavior about Coarse-Grain Ti-22Al-25Nb Alloy**

Y.Z. Li, Z.K. Yao, W. Zhou, C. Qin, H.Z. Guo and X.B. Liang 9

### **Friction Stir Processing: An Operational Method to Improve Ductility in Pure Copper**

V. Rezazadeh, A. Sharbatzadeh, A. Hosseinzadeh, A. Safari and S. Salahi 14

### **Microstructure Analysis for Emulsified Asphalt Cement Concrete**

J. Fu, Z.M. Shi, D.R. Dai and J.B. Huang 20

### **Use of Cement Hydration Stabilizer Admixture at Ready Mix Concrete to Avoid Material Waste**

A.N. Haddad, B.G.F.R. Cortes and A.C.J. Evangelista 24

### **Experimental and Numerical Study of Ballistic Impact Performance on UHMWPE Composites**

Y.K. Wen, C. Xu, A.J. Chen and S. Wang 30

### **Spectroscopic Characterization Technical High Resolution of Gold from a Memory Card RAM**

M.A. Cortes, M.L.D. Patiño, A.R. Martínez, R.G. Tapia and R.M.M. Alemán 37

### **Preparation of Castor Oil-Based Waterborne Polyurethane and its Application in Electrostatic Copy Paper Surface Enhancing**

H.M. Fan, C. Zhang, Y.Q. Ma and J.A. Liu 42

### **Carbon Fiber Reinforcing Frame Joint with Shear Failure of Core Area**

J. Hu and Z.Y. Yang 48

### **Synthesis and Characterization of Reactive Michler's Ketones**

Q.H. Huang, X.Q. Dou, X.X. Bai, Z.Y. Hu and C.J. Cheng 54

### **Simulating the Effect of Current Pulse on Plasticity of the Pure Aluminum 1A99**

S.H. Peng, J.J. Yang and Y. Li 58

### **Study of Gypsum Dehydration Time in CaCl<sub>2</sub> Solution**

K. Dvořák 64

### **Slag-Sulphate Binder Preparation**

D. Gazdič 68

### **Crystal Field Analysis of the Magnetization Curves of HoFe<sub>11</sub>Ti under High Pressure**

G. Su 72

### **Analysis of Two Surfaces under Viscoelastic Contact**

M. Mongkolwongrojn, J. Panichakorn, S. Supawanich and S. Chutima 77

### **Effect of Silver Content on Bulk Properties and Interfacial Morphology of Sn-xAg-Cu Solders**

P. Li, X.L. Gu, X.G. Liu and H.F. Zhong 83

### **The Structural Characteristics of CIS Thin Films Prepared by Electro-Deposited Method**

K. Liu, J.S. Yang, R. Li, W. Peng and S. Pan 88

### **Modeling of BOF Steelmaking Based on the Data-Driven Approach**

J.N. Li, Y. Li, F. Liu, S.P. Bie, C.C. Tang and X.L. Zhang 92

### **Service Life of Cementitious Photocatalytic Paints Newly Formulated**

D. Enea, D. Enea, L. Bottalico and T. de Marco 98

### **On the Influence to Social Life of the Artistic Features in the Reuse of Materials**

Z.Y. Li, W.P. Hu, Y. Liu, J. Li and T.F. Wang 104

## Chapter 2: Nanotechnology

<b>Using the Superficial Resonant Peak and PCA for Determining the Gold Nanoparticle Diameter</b>	111
J.C. Martínez-Espinosa, T. Cordova-Fraga, A. Reyes-Pablo and M. Vargas-Luna	
<b>Pull-in Voltage Analysis of Carbon Nanotube Based Electrostatic Actuators by Using the ANSYS Software</b>	117
P.A.G. Sankar and K. Udhayakumar	
<b>Variation of Concrete Strength with the Insertion of Carbon Nanotubes</b>	124
A.N. Haddad, J.F. de Morais and A.C.J. Evangelista	
<b>Nonlinear Optical Studies of SWCNT+Coproporphyrin III Hybrid Systems</b>	132
I.M. Kislyakov, N.R. Arutyunyan, E.D. Obraztsova, I.S. Sheiko, S.A. Povarov, A.V. Venediktova and C.S. Yelleswarapu	
<b>Localized Surface Plasmon Resonance of Single Silver Nano-Hemisphere</b>	137
R. Li, K. Liu, S. Pan and J.H. Ding	
<b>Laser Driven Paraffin Microsphere Transportation on a Single Carbon Nanocoil</b>	141
Y.M. Sun, Y.L. Liu, H. Ma and L.J. Pan	

## Chapter 3: Management, Analysis and Engineering Research

<b>Research on Emergency Management System Based on Cloud Computing</b>	147
Y.X. Chen and C.B. Xie	
<b>Measurement and Testing of the NSRRC Power Supply for Conduction EMI</b>	153
C.Y. Liu and K.B. Liu	
<b>The Field Current Research on Paratactic Structure Hybrid Excitation Synchronous Generators for Wind Power Generation</b>	159
C.H. Zhao, J.C. Li, J.L. Sun and X. Hu	
<b>Operating Mode Analysis on Paratactic Structure Hybrid Excitation Synchronous Generators for Wind Power Generation</b>	166
C.H. Zhao, J.L. Sun, J.C. Li and X. Hu	
<b>The Research and Application of Configuration Management Based on Equipment of PDM</b>	172
C. Zheng, C. Xu and K. Cao	
<b>Analysis of Stress in Half-Space Using Jacobian of Transformation and Gauss Numerical Integration</b>	178
R. Čajka	
<b>Theoretical and Experimental Investigation of Machining of AISI H13 Steel</b>	187
T. Márton and F.B. Zsolt	
<b>Analysis of Machinery Manufacture and Production from the Metal Mechanics Perspective</b>	193
Y. Xia	
<b>Horizontal Friction Parameters in Soil – Structure Interaction Tasks</b>	197
R. Čajka	

## Chapter 4: Control, Automation and Detection Technologies

<b>Path Programming and Motion Controlling of AMR</b>	209
J.H. Luo, Y. Zhang and X.H. Wang	
<b>Research on Voltage Oriented Control Strategy of Grid-Connected Inverter of Wind Power Generation</b>	212
Y. Yang, G.M. Lan, Z.Q. Sun, J. Guo and Z.Q. Zhang	
<b>Intelligent Fault Diagnosis of Gear Box Based on BSS and SVM</b>	218
W.J. Ma, R.X. Yu, J.Y. Wang and X.F. Wan	
<b>A Novel Key Management Strategy for Heterogeneous Wireless Sensor Networks</b>	224
Y.Q. Zhang	
<b>Solving Secure Problems for Wireless Sensor Networks Using Clustering and OKS</b>	230
Y.Q. Zhang	
<b>The Select Device of Weight Coefficient in the Vehicle-Use Engine Performance Optimization Process</b>	237
J.H. Luo, X.H. Wang and Y. Zhang	

<b>Comparison and Application of Two Mathematical Models in Predicting and Determining the State of Deposition and Slagging of Coal Burning Boiler</b>	
X.Q. Wen	240
<b>Predicting the Characteristics of Biofouling Mass Based on RBF Network</b>	
X.Q. Wen	246