

Table of Contents

Preface, Committee

Chapter 1: Nanomaterials, Nanotechnologies and Semiconductors

Silica Rice Husk Supported Ag/ZnO Nanoparticles for an Improved Visible-Light Photocatalytic of Methylene Blue J. Andas and N.W. Subri	3
Borosilicate Frit Addition Impact on the Structure and Electric Behavior of ZnO Nanoparticle-Based Varistors R.K. Sendi and A. Munshi	9
Plugging Agent of Shale Base on Nano Flexible Polymer Y.X. An, G.C. Jiang, Y.R. Qi and Q.Y. Ge	15
Dielectric Study of Electron Capture Centers in Sillenite Crystals $\text{Bi}_{12}\text{SiO}_{20}$ A.V. Ilinskii, R.A. Castro, L.A. Nabiullina, M.E. Pashkevich and E.B. Shadrin	20
Self-Cleaning and Antibacterial Properties of Paint Containing ZnO and WO_3 Co-Doped VO_2 Thermochromic Nano-Pigment V. Prommin, L. Sikong and K. Kooptarnond	27
Synthesis of h-MoO_3 and $(\text{NH}_4)_2\text{Mo}_4\text{O}_{13}$ Using Precipitation Method at Various pH Values and their Photochromic Properties P. Jittiarporn, L. Sikong, K. Kooptarnond, W. Taweeprada, P. Chooto and M. Khangkhamano	34
The Effects of Bagasse Fiber Loading on the Mechanical Properties of Skim NR–Clay Nanocomposites T. Nampitch and R. Magaraphan	42
UV-Blocking Property of Nano-ZnO Thin Film Coating on Silk Fabric T. Fan, X.M. Han, Z.L. Liu, L.Q. Li, Y.P. Liu and M. Lu	50

Chapter 2: Biomedical Engineering and Biotechnologies

Choosing the Right Antioxidant Supplement for Protecting Liver from Toxicity of Engineered Nanoparticles : A Comprehensive <i>In Vitro</i> Screening H. Türkez, E. Sönmez, E. Aydin, A. Hacimuftuoglu and E. Öztetik	57
Fabrication of Ascorbic Acid Biosensor Based on Coupling Polyethylene Glycol Modified Silk Fibroin Membrane onto Glassy Carbon Electrode P. Ratanasongtham, L. Shank, J. Jakmunee, R. Watanesk and S. Watanesk	63
Biocompatible Cardiac Sensor with Continuous Arrhythmia Monitoring for Human Wellness J.H. Lee	71
Low Temperature Preparation of Thiocarbamide Doped TiO_2 Film on Stainless Steel and its Antibacterial Efficiency against <i>Staphylococcus aureus</i> M. Masae, P. Pitsuwan, L. Sikong, P. Kongsong, A. Rattanapong and C. Jaidum	78
Boron Compounds Counteracts Oxidative Stress Mediated Genotoxicity Induced by Fe_3O_4 Nanoparticles <i>In Vitro</i> H. Türkez, E. Sönmez and A. Tatar	84
Influence of the Veneering Thickness on Stresses in All-Ceramic Crowns L. Porojan, F. Topală and C. Savencu	91
Biomechanical Behavior of All-Ceramic Crowns with Variable Thicknesses of Zirconia Frameworks L. Porojan, F. Topală and S. Porojan	97
Technology Optimization on Preparation of Peanut Antioxidant Peptides by <i>Bacillus Subtilis</i> Solid State Fermentation Method L.N. Yu, T.T. Xu, C.S. Zhang, J. Sun and J. Bi	103
Binding Affinity Analysis of Aptamer Targeted to Live Bacterial Cells C. Zhang, X.F. Lv, H. Qing and Y.L. Deng	109

Chapter 3: Applied Electrochemistry

Electrochemical Investigation of the Effects of Acid Concentration and Dissolved Oxygen on the Corrosion Behavior of Austenitic Low-Nickel Stainless Steels in Citric Acid F. Mulimbayan and M.G. Mena	115
Effects of Organic Additives on Electrochemical Properties of SiO_x Electrodes in Lithium Secondary Batteries S.R. Yoon and S.K. Jeong	121
Electrochemical Properties of NbO as a Negative Electrode Material for Lithium Secondary Batteries K.S. Park, S.K. Jeong and Y.S. Kim	126
Comparative Study of the Corrosion Behavior of Low-Nickel AISI 202 and Conventional AISI 304 Stainless Steels in Citric Acid Using Electrochemical Techniques F. Mulimbayan and M.G. Mena	131

Chapter 4: Materials and Processing Technologies in Mechanical Engineering

Preliminary Study of Ultrasonic Assisted Underwater Laser Micromachining of Silicon W. Charee, V. Tangwarodomnukun and C. Dumkum	139
Bubble Formation in the Underwater Laser Ablation of Silicon W. Charee, V. Tangwarodomnukun and C. Dumkum	144
Tool's Edges Fragmentation at Gear Hobs – A Method to Reduce Cutting Vibrations C.S. Simionescu	149
Recovery of Aluminum Alloy A380 from Machining Chips B.J. Xiong, L. Fang, X.Z. Zhang, J.X. Zhou, H. Hu and C. Liu	155
Effect of Activating Flux on the A356 and 6061 Aluminum Alloy GMA Welds H.L. Lin and W.K. Wang	161
Effects of Root Opening on Physical and Mechanical Properties of the Double Side Welded of Ship Materials Y. Purwaningrum, Triyono, T.R. Argihono and R. Sutrisno	167
Porosity Defects Induced by Semi-Solid Isothermal Heat Treatment in Cast Hypereutectic Al-18% Si Alloy M. Ramadan, N. Fathy, K.S. Abdel Halim and K.M. Hafez	173
Modification Behavior and Microstructure Evolution during Solution Heat Treatment of A356 Alloys with Al₂Ca and Excess Mg S.H. Ha, S.Y. Lee, Y.O. Yoon and S.K. Kim	179
Influence of Alloying Elements in ZnAl5 Based Alloys on Melting Temperature, Tensile Strength and Vickers Hardness R. Koleňák and I. Kostolný	185
Tensile Properties and Microstructure of Friction Stir Welded Joints 2195-T8 Aluminum Alloy K. No, Y.R. Lee, J.H. Yoon, J.T. Yoo and H.S. Lee	191
Primary Radiation Damage of BCC Iron under Uniaxial and Hydrostatic Stress: MD Simulation M. Tikhonchev and V. Svetukhin	197
Improvement in Plastic Strain Ratio of AA1050 Al Alloy Sheet by Enhancing the <111>//ND Texture Component S.K. Nam, I.S. Kim and D.N. Lee	203
Influence of Friction Stir Welding Parameters on the Mechanical Properties of EN AW-7075 Weld Joints M. Nagy and M. Behúlová	210
Effects of Strain-Rate and Deformation Mode on Strain-Induced Martensite Transformation of AISI 304L Steel Sheet A. de Melo Pereira, M. Costa Cardoso and L.P. Moreira	216

Effects of Cu Addition on the Precipitation Process of Al-9Zn-4Mg-xCu (wt. %) Alloys at 130°C	
B.T. Sofyan, I. Husna and M. Syahid	222
Experimental Analysis of Forming Limits and Thickness Strains of DP600-800 Steels	
M. Costa Cardoso, A. de Melo Pereira, F.R.F. da Silva and L.P. Moreira	230
Modeling and Optimization for Multiple Criteria of Hole Quality in Hardened Steel Drilling	
P.Y.M.W. Ndaruhadi and B. Santosa	236
Modeling of Cut Depth and Surface Analyses of Silicon Wafer in Laser Micromachining Process	
S. Mekloy, V. Tangwarodomnukun and C. Dumkum	242
Resistance Spot Welding Process Optimization Using Taguchi Robust Method for Joining Dissimilar Material	
Z. Aizuddin, B.A. Aminudin, P.S. Sanda and R.M.S. Zetty	248
An Analysis on Finding the Optimum Die Angle of Polylactic Acid in Fused Deposition Modelling	
N.A. Sukindar and M.K.A. Mohd Ariffin	254
Calorimetric and Thermodynamic Studies of Complex Ferrites	
M.M. Mataev, M.R. Abdraimova, Z.D. Batyrbekova and A.M. Madiyarova	260

Chapter 5: Chemical Materials and Chemical Technologies

Effect of Cationization Conditions on Dyeing Properties of Hemp Fabric with Natural Dye Extracted from Arabica Coffee Ground	
S. Butthongkum, T. Sritapunya and R. Mongkholrattanasit	267
Crystallinity, Tapping and Bulk Density of Microcrystalline Cellulose (MCC) Isolated from Rice Husk (RH)	
A. Zuliahani, R. Nurul Nadhirah, A.R. Rozyanty, W.I. Nawawi and A.B. Nor Hanani	272
Phase Morphology, Mechanical and Thermal Properties of Poly (Trimethylene Terephthalate) and Poly (Ethylene Terephthalate) Blends	
P.J. Jia, Y.F. Wang, H.B. Li and M.T. Run	277
Morphology and Mechanical Properties of Poly (Lactic Acid) and Acrylonitrile-Butadiene Rubber Blends with Organoclay	
S. Wacharawichanant, C. Wisuttrakarn and K. Chomphunoi	284
Fabrication and Characterization of Porous Activated Carbon from Coconut Shell by Using Microwave-Induced KOH Activation Technique	
M.I.M. Nayai, K. Ismail, M.A.M. Ishak, N.R. Zaharudin and W.I. Nawawi	289
Isoconversional Methods for Kinetic Modeling of Kerogen Pyrolysis Using TG Data	
A. Shawabkeh, K.S. Abdel Halim and O. Al-Ayed	299
First Principles Density Functional Theory Investigation on the Structural, Energetic and Electronic Properties of 6-Bromo-4-Oxo-4H-Chromene-3-Carbaldehyde	
P.L. Toh, R. Rasmi, M. Meepriruk, L.S. Ang, S. Sulaiman and M.I. Mohamed-Ibrahim	308
Detailed Modelling of Hydrocarbonaceous Media Separation Process	
E.V. Nikolayev and S.N. Kharlamov	315

Chapter 6: Technologies of Environmental Engineering, Health and Safety and Waste Utilization

Xylol and Glutaraldehyde Replacement at a University Hospital and a Laboratory of Human Anatomy	
K.L. Manfredini and I. do Nascimento Filho	323
Natural Materials to Absorb Water from Environment	
A.S. Ortega, M.A. Rubio Toledo, R.V. Uribe and S.A. Utrilla Cobos	329
The Establishment of Real-Time PCR Detection System of Aspergillus Niger in Peanut	
C.S. Zhang, J. Sun, L.N. Yu, J. Bi and W.W. Zhao	333
The Anti-Aspergillus Flavus Activity of Composite Coating Using Lemon Aldehyde and Chitosan	
C.S. Zhang, J. Sun, L.N. Yu and J. Bi	338

Copper Removal with Biological Treatment Aided with Modified Adsorbents S.R. Mohamed Kutty, E.H. Ezechi, I. Umar Salihi, S.G. Khaw, C.L. Lai and M. Hasnain Isa	342
Preparation and Metal Removal from Chitosan/PEG Blend K. Locharoenrat	348
Multi-Cycle Photodegradation of Anionic and Cationic Dyes by New TiO₂/DSAT Immobilization System W.I. Nawawi, S.K. Ain, N.R. Zaharudin and S. Sahid	353
Enhanced Photocatalytic Degradation of Fulvic Acid Using N-Doped SnO₂/TiO₂ Thin Film Coated Glass Fibers under UV and Solar Light Irradiation for Drinking Water Purification P. Kongsong, L. Sikong, N. Sutham and V. Rachpech	359
The Effect of Reactive Red 4 Dye as a Sensitizer in Enhancing Photocatalytic Activity of TiO₂ for Degradation of Methyl Orange F. Bakar, M.S. Azami, S.K. Ain, N.R. Zaharudin and W.I. Nawawi	366
Nitrogen Doped TiO₂ Prepared under Microwave Irradiation: Effect of Different Irradiation Light M.S. Azami, S.K. Ain, N.R. Zaharudin, F. Bakar and W.I. Nawawi	372
Sorption of Copper and Zinc from Aqueous Solutions by Microwave Incinerated Sugarcane Bagasse Ash (MISCBA) I.U. Salihi, S.R. Mohamed Kutty, M. Hasnain Isa, U.A. Umar and E. Olisa	378
Computational Fluid Dynamics Modelling of Photoelectrocatalytic Reactors for the Degradation of Formic Acid Y.W. Phuan, E.A.L. Lau, H.M. Ismail, B.K. Lee and M.N. Chong	386

Chapter 7: Architecture, Building Materials and Construction Technologies

Ageing Documentation of Hydrophilic Mineral Wool Used in Green Roof Assemblies P. Vacek and L. Matějka	397
Optimum Blend Ratio of Tropical Soil and Porcelain Tile Residue to Highway Applications Based on Statistical Analysis of the Results of Unconfined Compression Tests S.C.J. Fernandes Nobre de Araujo, C.M.L. Costa and Y. Costa	402
A Study on Indoor Thermal Improvement of Container for Low Income Housing in Jakarta Y. Mariana, R. Hendarti and M. Prastiwi	408
Thermal Performance Comparison between Single and Double Storey Terrace Houses in Melaka, Malaysia F. Abdul Rashid, A.M. Ressay Aminuddin and N.A. Ghaffar	416
Study on Green Vertical Housing Using Hybrid Ventilation System Based on Air Changes per Hour Factor V. Soebiyanto, F.U. Sjarifudin and J. Efendi	423
The Virtualisation Process of the Joglo Cultural Heritage House Using Computer Aided Design Y. Mariana, N. Nurdiani and W. Katarina	429
Experimental Evaluation of Residual Stresses in the Concrete L. Zvolánek, M. Kratochvíl, J. Kadlec and I. Terzijski	433
Soil Stresses on Carbon Steel Pipe Undergoing Uplift Y.D. Costa, L.S. Moraes and C.L. Costa	439
Experimental Assessment of the Influence of Wind Speed on the Airflow and Temperatures in the Open Joint Ventilated Facade Cavity E. Šagát and L. Matějka	444
Effect of Aggregate Size on Punching Strength of Reinforced Concrete Slabs D.F. Wen Jing and L.T. Leong	450
Comparing the Effectiveness of Friction Damper and Tuned Mass Damper Using Numerical Simulation O.H. Kwon and S.H. Park	455
Research on Seismic Performance of Framed Shear Wall Structure X.F. Zhou and D.D. Lv	461
Economic Comparison of Fire Fighting Measures of Gypsum-Based Materials M. Halířová, R. Janoušek, H. Sevciková, R. Fabian and E. Machovčáková	467

Thermal Technical Failures of Critical Construction Details D. Donová, N. Zdražilová and K. Havlíková	472
Pavement Design Reinforced Base Researches S.A. Matveev, E.A. Martynov and N.N. Litvinov	478
Calculation of the Pavement Reinforced Design Using Model of Multilayered Plate on the Elastic Base S.A. Matveev, E.A. Martynov and N.N. Litvinov	484
The Future of Architecture in Modular Construction M. Mlčochová and P. Řihák	489
Influence of the Type of the Fiber Component of the Stabilizing Additive for Stone Mastic Asphalt Concrete on the Structure of an Organic Binder V.V. Yadykina, A.M. Gridchin, A. Trautvain and S.S. Tobolenko	494
Evaluation of Measurement in Crawl Space of Wooden House S. Korbelova and L. Kucerova	501
Dynamic Collapse Analysis of Single-Layer Lattice Domes with Supporting Frames H.M. Li, W. Lu, J.L. Wang, X.Q. Ren and J.H. Sun	506
The Variational Principles of Coupled Systems in Fatigue Problem Undergoing Large Range Damage W.F. Tan	514
Increasing Productivity in Stair Construction Using EPS Technology as an Alternative Material W. Wangidjaja, N. Nurdiani and W. Katarina	521
Influence of Freezing-Thawing on Shear Strength of Frozen Soil in Northeast China R. Chen, D.Z. Li, D.X. Hao and K.L. Wei	525
The Effect of Filler Based on Calcium Silicates on Strength of Lime Composites V. Loganina, L.V. Makarova and R.V. Tarasov	531
Study on Tensile Creep Characteristics of High Strength Concrete G.G. Liu, G.R. Zhang, Y.S. Zhang and L. Lu	535
Heat Capacity Measurements of Loose Materials with Respect to Long Heat Accumulation V. Šípková, D. Bujdoš and M. Vodičková	542
Thermal Analysis Application in Study of Alkali-Activated Blast Furnace Slag P. Mec, J. Boháčová and M. Turicová	547
Analysis of the Settlement of Roadbed-Culvert Transitional Section in the High Salinity Regions Y.P. Wu, H.A. Huang, Z.B. Xu, J. Wang, G. Wang and E.H. Peng	554
Analysis of the Culvert Foundation Settlement under Different Construction Methods in High Salinity Regions Y.P. Wu, G.F. Pan, H.D. Hu, G. Wang, J. Wang and Z.B. Xu	559
Study on Continuum Damage Mechanics Model for High Cycle Fatigue X.T. Shi, Y.C. Xiao, H. Chen and B. Huang	564
Distribution of Displacements in Elastic Layer S.A. Matveev and A.S. Belokopytov	568
Analysis of Predictive Calculation Methods of Airborne Sound Insulation N. Zdražilová, D. Donová and I. Skotnicova	573
Calculation of an Anisotropic Hemispherical Shell with Inhomogeneous in the Meridian Direction V.I. Andreev	579
Non-Linear Behavior of Spherical Shells under Static Ring Loads E.E. Karataş and R.F. Yükseler	583

Chapter 8: Research and Design in Area of General Mechanical Engineering

Elastohydrodynamic Lubrication in Ball Thrust Bearing K. Wongseedakaew	593
Semiautomatic High Frequency Ultrasonic Testing System for Welded Plastic Pipes D. Nitoi, C. Petriceanu, I. Severin, A.M. Bogatu and O. Teodorescu	599

Optimization Design and Structure Design of Precision CNC Machine X.R. Ye	605
Parametric Study of Influence of Assembly and Design on the Center of Gravity of Public Buses S. Dechjarern and P. Chuchuaay	609
Research and Application of a Novel Cluster Well Pumping Unit T. Ren, W.T. Qu, X.Q. Kang and W. Sun	615
Development of Ultrasonic Surface Treatment Device Y.J. Qian, S.W. Han and H.J. Kwon	620
Simulation and Experimental Study of a Scintillation Fiber Detector of the Activities of ^{63}Ni-, ^{89}Sr- and ^{90}Sr-Based Radiation Sources S.G. Novikov, A.V. Berintsev, V. Svetukhin, A.S. Alekseyev, A.A. Chertoriyskiy, R.A. Kuznetsov, N.N. Andreychuk and V.V. Prikhodko	626
Multi-Condition Analysis and Optimization of Sprayer Frame Z.H. Wang, J.B. Wu and J.W. Liu	632
Simulation on Safety Property of Inner Support in Tire X. Zhang, Q.H. Zhang, G.Q. Wang, K.L. Wu, D. Song and Y.W. Zhang	639
Design of an Improved Nonlinear Disc Spring Vibration Isolator J. Fang and H. Dong	643
Dynamic Behavior of Cellular Materials under Combined Shear-Compression Y.Y. Ding, S.L. Wang, Z.J. Zheng, L.M. Yang and J.L. Yu	649
Energy Model of Pulse Continuously Variable Transmission Y. Xue, Z. Gou, H. Yin and X.F. Zhang	654
Finite Element Analysis Using Free Mesh Method J.S. Lee	661
The Research on the Design of Colors, Patterns and Texts for Paper Stocks Tea Packaging Visual Design C.C. Shen	665

Chapter 9: Mechatronics, Control and Robotics

A High Accuracy Speed Control of DC Motor Using Adaptive Torque Compensation on Lyapunov Stability with Kalman Filter C. Prattanaruk and J. Srisertpol	673
Design of Sliding Mode Based Differential Flatness Control of Leg-Wheel Hybrid Robot M. Mauledoux, E. Mejia-Ruda, O. Aviles Sanchez, M.S. Dutra and A. Rojas Arias	681
Research on Integrated Shift Control Strategy for Automatic Transmission L.Y. Zhang, Y. Fu and X.Z. Li	687
Yaw Angle Measuring System of Omni-Directional Mobile Robot Based on EKF F. Jia and Y.F. Ji	693
Development of Parallel Delta Robot System Controller Based on Raspberry Pi and FPGA W. Sanngoen, W. Po-Ngaen, C. Charitkhuan and K. Doungjitjaroen	698
Techniques for the Modelling and Control of Cutting Tools by the Use of 3D Scanners and CAD Programmes Ş. Olimpia Pavlov, C. Dogariu and E. Savu	705
Research and Implementation of Real-Time Computing Algorithm of S Curve Acceleration and Deceleration for Step Motor F. Jia, X.Y. Wu and Y.L. Mao	712
Modeling and Control of a Haptic Lever to Regulate the Speed in Maritime Vehicles V. Prada, G. Conde, A. Figueredo, J. Sánchez and A. Santos	718
The Foams and Emulsions Ontology Model I.L. Artemieva and N.V. Ryabchenko	723

Chapter 10: Engineering Practice in Renewable Energy Sector

Recent Trend of Solar Tracking System for Electric Power Conversion S. Lekchaum and K. Locharoenrat	731
---	-----

Effect of Shielding Object to the Specific Heat Demand for Heating of a House H. Vaculíková, D. Donová and N. Zdražilová	737
Experimental Study on the Wet Electrostatic Precipitator for Purifying Biomass Fuel Gas L.C. Xiao and X.Y. Yang	743
Wind Potential Assessment for the Utilization from Wind Energy in the Household Level: A Case Study of Nakhonratchasima Thailand Y. Keawsuntia	749
Investment Profitability Analysis for Wind Power Project in Taiwan J.N. Sheen	753

Chapter 11: Traffic and Transportation Systems

Urban Rail Transit Types and Single Wire on the Propagation Law of Delays D.X. Zhang, Y.H. Wang and Y.F. Wang	763
Effect of Platform Screen Door on Platform of Urban Rail Transit Passenger Crowding Analysis X.W. Shi and Y.H. Wang	767
Passenger Safety Assessment in Urban Rail Transit Station Based on Systematic Dynamics N. Jia and Y.H. Wang	771
Dimension Determination of Highway Guardrail Based on Safety Collision with Vehicle X. Zhang, Y.W. Zhang, J. Li, D. Song, K.L. Wu and Q.H. Zhang	777
WiDRIVE Safety Innovation: Wireless Device for Regulation and Information on Vehicular Events R. Dela Torre and W. Lopez	781
A Method to Evaluate Vehicle Impact Speeds in Passenger Car-Pedestrian Accidents C.J. Feng, K. Li and Z.Y. Yin	788

Chapter 12: Engineering Solutions in Area of Education

Logatomic Tests as a Method of Evaluation of Speech Intelligibility in High Resolution R. Drtina and J. Šedivý	795
A Comparative Analysis of the Frequency Spectrum of Speech in Logatomic Tests and Measurement Signals R. Drtina and J. Šedivý	800
The Concept of Electrical Part of the Model of MicroEnergy Sources for Electrical Laboratories R. Drtina, J. Lokvenc, J. Šedivý and J. Škoda	805
The Concept of Mechanical Part of the Model Micro-Energy Sources for Electrical Laboratories R. Drtina, J. Lokvenc, J. Šedivý and J. Škoda	810
An Instructional Assistant Collaboration Server System Based on Cloud Platform W.H. Wang, Q. Zhang, Y.H. Cao and D.Y. Shi	816

Chapter 13: Industrial Engineering and Management

Effective Methodology of Linking Enterprise Architect with Application Framework and Solutions in Business Practice J. Šedivý and R. Borkovec	823
The Research of Compose Method for Removal/Install Part in Aircraft Maintenance Manual X. Jin, S. Chen, Z.Y. Jia and Z.Y. Zeng	828
Improvement of Administration Processes in Manufacturing Companies L. Šťastná and M. Šimon	835
Petri Net Simulator for Small-Medium Enterprises' Business Process Management in a Network Business Environment L. Pistol, R. oni-Bucea-Manea and R. oni-Bucea-Manea	841

A Hybrid Differential Evolution Algorithm Based on Dynamic Variable Neighborhood Search for Permutation Flowshop Scheduling Problem W.B. Liu	847
Performance Studies on Differential Evolution Algorithm and Shuffled Frog-Leaping Algorithm for Simulated Manufacturing Problems L. Ruekkasaem and P. Aungkulanon	858
Comparison of Bee Algorithm and Scheduling Methodologies: A Case Study of Manufacturing in Thailand P. Aungkulanon	864