

Table of Contents

Preface, Committes and Organizers

Chapter 1: Ceramics, Semiconductors and Composites

BaSO₄/Polyvinyl Alcohol Composites for Radiation Shielding V. Thongpool, A. Phunpueok, N. Barnthip and S. Jaiyen	3
Characterization and Optical Properties of Zinc Oxide Films Prepared by Microwave Technique S. Narksitipan and T. Awirut	7
Design of Experiments for (100) Si Vertical Wall Wet Etching Using Sonicated NaOH Solution C. Pakpum and N. Pussadee	12
Dielectric Properties of Y₂NiMnO₆ Ceramics at Various Sintering Times and Temperatures P. Deeyai, T. Sareein, B. Putasaeng and N. Chathirat	16
Effect of Barium Titanate Additives on Dielectric Property of PLZT Ceramics L. Chumprasert, N. Funsueb, A. Limpichaipanit and A. Ngamjarurojana	21
Effect of Blowing Agent on Cell Morphology and Acoustic Absorption of Natural Rubber Foam W. Harnnarongchai and K. Chaochanchaikul	25
Effect of Electric Field and Temperature in Electrochemical Dissolution and Deposition Process on Morphologies of ZnO Nanostructures B. Toboonsung	30
Effect of Sintering Parameter on Ferroelectric Properties in PZT Based Ceramics T. Promjun, Y. Manjit, S. Sukprasong and A. Ngamjarurojana	34
Effect of Temperature on the Structural and Magnetic Properties of Co_{0.7}Zn_{0.3}Fe₂O₄ Ceramic Prepared from Solid State Reaction P. Klumdoung and P. Pankaew	38
Effect of Zr/Ti Ratio on Electrical Properties of Pb_{0.91}La_{0.09}(Zr_xTi_{1-x})O₃ Ceramics N. Funsueb, S. Somwan, L. Chumprasert, T. Promjun, A. Limpichaipanit and A. Ngamjarurojana	42
Effects of Catalyst on Carbon Nanotubes Synthesized by Thermal Chemical Vapor Deposition Method U. Pakdee, S. Srabua, A. Phongphala and C. Pawong	47
Effects of Milling Technique on Physical and Mechanical Properties of Lead-Free Ba(Zr_{0.3}Ti_{0.7})O₃ Ceramics C. Kruae-In and W. Leenakul	51
Electrical Properties of Y₂NiMnO₆ Ceramics Sintered at High Temperature T. Sareein, P. Deeyai, B. Putasaeng and N. Chathirat	55
Influence of Multifunctional Monomers on Gamma Irradiated Polylactic Acid K. Chaochanchaikul and W. Harnnarongchai	59
Investigation on Structural and Electrical Property of (1-x) PLZT - x PZN Ceramics L. Chumprasert, N. Funsueb, S. Somwan, A. Limpichaipanit and A. Ngamjarurojana	63
Local Structure and Phase Formation of Lead Zinc Niobate Powders by X-Ray Absorption Spectroscopy N. Funsueb, T. Promjun and A. Ngamjarurojana	67
Magnetic Field Dependent Dielectric Properties in Ba(Ti_{0.99-x}Mn_{0.01}Ta_x)O₃ Ceramics T. Sareein, A. Ngamjarurojana and R. Yimnirun	71
Optical Analysis of Bismuth-Based Glasses Doped Potassium Chromate J. Dutchanephet, S. Sukprasong, N. Sirikulrat and A. Ngamjarurojana	75
Preparation and Electrical Properties of Ba_{0.85}Sr_{0.15}Ti_{0.90}Zr_{0.10}O₃ Ceramics Doped Sn by Seed-Induced Method K. Sutjarittangtham, S. Eitssayeam, U. Intatha and W. Leenakul	80
Preparation of Poly(Vinylidene Fluoride)/Silica Composite Nanofiber by Electrospinning Technique M. Buddhakala and A. Muakngam	84

Properties of Mg Doped ZnO Films Prepared by Ultrasonic Spray Pyrolysis S. Thonglem, S. Sirisoonthorn, K. Pengpat, G. Rujijanagul, S. Eitssayeam, U. Intatha and T. Tunkasiri	88
Scintillation Properties of Ce-Doped LuYAP Crystal for Gamma Ray Detection A. Phunpueok, V. Thongpool and W. Chewpraditkul	93
Study Behavior of XPS Spectra of Ni, Mn, Y and O in Y₂NiMnO₆ Ceramics P. Deeyai, T. Sareein, B. Putasaeng and N. Chathirat	97
Surface Investigation of Laser Glazed Mullite Thin Films on Yttria-Stabilized Zirconia Coatings N. Sanpo, J. Tharajak, J. Wang and C.C. Berndt	104
The Dielectric Property of Y₂NiMnO₆ Ceramics Sintered at High Temperature T. Sareein, P. Deeyai, B. Putasaeng and N. Chathirat	108

Chapter 2: Recent Building Materials

Effect of Nano-TiO₂ on Mechanical and Thermal Properties of Cement Composites for Thermal Energy Storage Materials P. Jittabut	115
Microstructure and Dielectric Properties of 0-3 Cement/Rice Husk Ash-Lead Niobate Zirconate Titanate Ceramic Composites N. Jaitanong and A. Chaipanich	119
Physical and Mechanical Properties of Cement/Natural Rubber Latex/Rice Husk Ash Composites N. Jaitanong and T. Chaipunti	124
Physical Properties of Cement Mortar Containing Waste Ash S. Rukzon and P. Chindaprasit	129
Preparation and Characterization of Cement-TiO₂ Composites N. Kaewgabkam, N. Jaitanong and S. Narksitipan	133

Chapter 3: Biomaterials and Biomedical Engineering

Effect of Titanium Nitride on Properties of Hydroxyapatite-Based Composites for Biomedical Applications K. Chokethawai, G. Rujijanagul and T. Tunkasiri	139
Effects of Calcium Carbonate Synthesized from Cockle Shell on Characteristics of Calcium Phosphate Biphasic N. Lertcumfu, P. Jarupoom, P. Arkornsakul, T. Tunkasiri, D.R. Sweatman and G. Rujijanagul	143
Effects of the Sintering Temperature on Structural and Bioactivity in BaFe₁₂O₁₉-P₂O₅-CaO-Na₂O Bioactive Glass Ceramic P. Intawin, K. Pengpat, W. Leenakul and T. Tunkasiri	147
Fabrication of Polycaprolactone/<i>Centella asiatica</i> Extract Biopolymer Nanofiber by Electrospinning S. Manotham, K. Pengpat, S. Eitssayeam, G. Rujijanagul, D.R. Sweatman and T. Tunkasiri	151
Optical Microarray Grating Biosensors N. Chathirat, C. Hruanun and A. Poyai	155
Photolithographic Process for Creating Micro-Grating on Silicon Substrate for Biosensor Application N. Chathirat, C. Hruanun and A. Poyai	159
Predicting the UV Spectrum of Single Stranded DNA N. Chathirat	163
Preparation of 2 wt% ZnFe₂O₄/HAp Ceramic for Future Biomedical Applications P. Klumdoung and P. Pankaew	167
Processing of Elastic Silk Sericin/Gelatin Composite Film for Future Cosmetic Applications P. Pankaew, P. Klumdoung and K. Naemchanthara	171
Synthesis of Diamond-Like-Carbon Films as the Coating Prototype for Biomedical Materials N. Barnthip and A. Muakngam	175

A Study of the Preparation of Silk Sericin/Chitosan Composite Film for Future Wound Dressing Applications	
P. Pankaew, P. Klumdoung and K. Naemchanthara	179
The Fabrication of Titanium Dioxide (TiO₂) Thin Film via Deposited Spray Pyrolysis Using for Antibacterial Applications	
P. Lertloypanyachai, E. Kaewnuam and K. Sreebunpeng	183
Characterization and Gel Properties of Gelatin Extracted from Waste Fish Scales	
N. Nuamsrinuan, N. Suttisiri, E. Hoonnivathana, P. Limsuwan and K. Naemchanthara	187
Antimicrobial Effect of Squid Ink on Common Microbial Causing Biofilm Attaching to Silicone	
D. Nicomrat and J. Tharajak	191
Antioxidant Activity in the Petal Extract of PAP1 Transgenic Tobacco	
S. Kanthang and K. Sompornpailin	195
DNA Biosensor on Optical Nanograting Structure	
N. Chathirat, C. Hruanun and A. Poyai	199
Heat Effect on Antimicrobial Properties of Plasticizer PEG Blended Chitosan	
D. Nicomrat, J. Tharajak and P. Soongsombat	203

Chapter 4: Materials and Technologies in Textile Industry

Colour Fastness Property of Printed Cotton Fabric Using Warp Yarn Printing Technique	
K. Ariyakuare, C. Klaichoi, N. Phaisarntantiwong and S. Senatham	209
Needleless Electrospinning of Silk Fibroin/Gelatin Blend Nanofibres	
N. Sasithorn and L. Martinová	213
UV-Protection Property of Silk Fabric Dyed with Natural Indigo by Using Padding Technique: A Focus on Effect of Ferrous Sulfate Mordant	
R. Mongkholrattanasit, C. Saiwan, C. Klaichoi, N. Rungruangkitkrai and P. Sasivatchutikool	217

Chapter 5: Advanced Technologies in Agriculture, Environmental Engineering and Waste Treatment and Recycling

Assessment of Heavy Metal Content in PM₁₀ at Amphoe Mueang Pathum Thani Province in Thailand	
W. Deelaman and C. Choomchuay	223
A Reliable Homemade Tissue Culture Protocol for <i>Dendrobium</i> Orchid Cultivation	
D. Nicomrat and J. Anantasaran	227
Environmental Survey on Physicochemical Parameters in Surface Water: A Case of Klong Prem Prachakorn, Thailand	
V. Boonyaroj, P. Peansawang, N. Sonchan and A. Sukrasorn	231
Heavy Rain and Drought Conditions in Thailand under Global Warming	
S. Saiuparad	235
Practical Homemade Copper Filter by Banana Peels, Sand and Charcoal for Wastewater Treatment	
D. Nicomrat and J. Tharajak	239
Predictability of the Northeast Monsoon Forecasts by the Educational Global Climate Model	
S. Saiuparad and D. Sukawat	243
Structure and Mechanical Properties of Water Buffalo Horns	
P. Surakamhang and C. Sangsubun	247
Study of Moisture of Rice by Using Reflection Spectroscopy	
T. Wittinanon and K. Chirapatpimol	251
Synergistic Effects of Cellulase-Producing Microorganisms for Future Bioconversion of Lignocellulosic Biomass	
D. Nicomrat and J. Tharajak	255
The Effects of Cytokinins on Plant Regeneration of Vetiver Grass (<i>Vetiveria nemoralis</i> A. Camus cv. Roiet)	
C. Khunchuay and K. Sompornpailin	259

The Removal Mechanisms of Organic Compounds in Household Wastewater by Soil Sediment	
V. Boonyaroj, J. Jinasam and W. Nachailan	263
The Study of Fluid Flows in Difference Hydroponics System Arrangements	
A. Pramuanjaroenkij, S. Naiyanart, P. Hintong and A. Sanbun	267
Waste Management Education for Sustainable Islands	
K. Navykarn and U. Muneenam	271
Odor Control in the Standard Thai Rubber 20 (STR 20) Industry by Using a Wet Scrubber	
W. Rattanapan	275
Variations of the Precipitation Water Vapor by Using GPS Data Triggered Raining in the Summer of Thailand	
N. Choosakul	279
Heating Energy Briquettes from Cashew Nut Shell	
S. Sawekwiharee, T. Boonchoo, A. Kuttiyawong and N. Chathirat	283
Application of the Ensemble Kalman Filter to a One-Dimensional Linear Advection Model	
S. Payakkarak and D. Sukawat	287
Fabrication of 2 wt% NiFe₂O₄/HAp Composite Ceramic for Future Heavy Metal Removal Applications	
P. Klumdoung, S. Pukjaroon and P. Pankaew	291
The Difference of Si/Al Ratio on Organo-Zeolite in the Adsorption of Atrazine and Linuron	
S. Nucharin	295
Surface Modification of Composite Membranes by Coating PVA/TiO₂ Layer	
B. Yalcinkaya and J. Chaloupek	299
A Comparison of Statistical Methods for Forecasting the Price of Jasmine Rice	
Y. Atikankul	304

Chapter 6: Engineering Decisions in Designing of Machines and Power

Novel Optical Trapping Micro-Sensor from PANDA Ring Resonator for Quantum Computer Processing	
C. Sripakdee and N. Sarapat	311
Wigner Representation for Investigation of Entangled Photon Evolution in Four-Wave Mixing Process within a Fiber Ring Resonator	
C. Sripakdee	316
Better Understanding Network of Electrical Terminal Stations by Topological Analysis	
S. Sodsee, M. Komkhao and W.A. Halang	321
NLARX Model Identification for Grid Tied Inverter Using Genetic Algorithm	
V. Vacharapanich, N. Pratinthong and D. Chenvidhya	325
The New Design of Fish Cake Making Machine	
P. Wirotcheewan and S. Peanprasit	329
The Response of Optotune EL-10-30 Adaptive Lens at Various Frequency of Supplied Electric Current	
T. Wittinanon and K. Chirapatpimol	333
Improving the Evolutionary Computation for General Keyboard Arrangement Problem	
V. Janthanasub and P. Meesad	337
A Mathematical Model for Determination of Electric Energy Performance of Small Solar Chimney System in Nakhon Ratchasima Province, Thailand	
P. Jittabut	341

Chapter 7: Innovative Technologies Education for Sustainable Development of Society

Application of Learning Management System for Online Learning Modules	
V. Jakchaikul	347
The Construction and Evaluation of Instructional Package on Vector Quantity	
S. Sirathanakul	351

