

Table of Contents

Preface, Committees

Chapter 1: Physical and Chemical Properties of Materials, Technologies of Chemical Synthesis

Scratch Resistance and Impact Strength of Semi Interpenetrating Networked PMMA and PU with <i>In Situ</i> Produced Silica	3
K. Silpcharu, R. Yeetsorn, N. Kreua-Ongarjnuukool, A. Kritanusorn and C. Tzoganakis	
XANES Studies on the Oxidation States of Copper Ion in Silicate Glass	9
K. Samkongngam and R. Buntem	
Mechanical and Morphological Properties of Sulfur-Cured Natural Rubber/Polyethylene/Epoxydized Natural Rubber Blends	14
K. Phatcharasit, W. Taweeprada and P. Phummor	
Studies on the Deterioration of Ancient Thai Manuscripts	19
J. Rueangyodjantana and R. Buntem	
Studies on the Deterioration of the Cordon of the Most Illustrious Order of Chulachomklao	24
K. Chuapanit and R. Buntem	
Thermoplastic Vulcanizates/Recycled Polypropylene Blend for Automotive OEM	29
R. Yeetsorn, T. Ungtrakul, K. Jariyakun, W. Prissanaro-on-Oujai and C. Tzoganakis	
Application of Dry Grass for Clay Brick Manufacturing	35
N. Phonphuak	
Effects of Alkali Treatment and Fiber Content on the Properties of Bagasse Fiber-Reinforced Epoxy Composites	40
S. Suckley, P. Deenuch, N. Disjareon and S. Phongtamrung	
Physico-Chemical and <i>In Vitro</i> Cytotoxic Properties of Alginate/Soy Protein Isolated Scaffolds for Tissue Engineering	46
P. Nooeaid, P. Chuysinuan, S. Techasakul, K. Lirdprapamongkol and J. Svasti	
Top Layer Coating for Improving Superhydrophobic Property of Latex Cup	52
S. Jindasawan and S. Supothina	
Properties of Rice Husk Ash Silica Filled Prevulcanized Deproteinized Natural Rubber Latex Film	57
P. Wongwitthayakool, S.G. Yang, J. Siripanth, C. Siriwong and T. Saowapark	
Effect of Cellulose Functionalization on Thermal and Mechanical Properties of Epoxy Resin	62
K. Leelachai, S. Ruksanak, T. Hongkeab, S. Kambutong, R.A. Pearson and P. Dittanet	
Synthesis of PAA-PAMPS-PNaSS Terpolymers as Ultraviolet-Tagged Scale Inhibitor for Industrial Water Cooling System	68
P. Jitrewas, S. Saengvattanarat, P. Tansiri, S. Pranee, S. Chuayprakong, C. Khemtong and S. Seeyangnok	
Fabrication and Mechanical Properties of the Biocomposites between Water Hyacinth Fiber and Paper Mulberry	73
P. Khankham, W. Nhuapeng and W. Thamjaree	
Preparation and Characterization of Chitosan-Gelatin Films with Na₂SO₄ Cross-Linked for Controlled-Release of Nitrofurantoin	78
W. Somphon and S. Samnaree	
Poly(Lactic Acid) (PLA) Electrospun Fibers Containing Rice Extract: Release Characteristics and their Antioxidant Activity	83
P. Chuysinuan, N. Chimnoi, L. Pattani, P. Khlaychan, P. Nooeaid and S. Techasakul	
Enhanced Photocatalytic Activity by Silver-Modified Bismuth Vanadate	88
C. Suwanchawalit, K. Roongraung, S. Buddee, S. Wongnawa and A. Patil	
Adsorption of Ammonia on Zirconium-Based Metal-Organic Framework: A Combined Experimental and Theoretical Study	93
S. Phikulthai, Y. Injongkol, T. Maihom, P. Treesukol, P. Maitarad, V. Tangsermvit, K. Kongpatpanich and B. Boekfa	

An Experimental and Theoretical Study on the Aldol Condensation on Zirconium-Based Metal-Organic Framework W. Thongnuam, S. Pornsatitworakul, T. Maihom, P. Treesukol, N. Jarusophon, P. Maitarad, K. Kongpatpanich and B. Boekfa	98
Combined Computational and Experimental Studies of Trans- and Cis-Isomers of Potassium Diaquabis(Oxalato)Chromate (III) S. Ruangchaithaweesuk, J. Chorkate, T. Maihom, P. Poolmee, P. Treesukol, T. Rungsawang, P. Maitarad and B. Boekfa	103
Synthesis and Characterization of Bismuth Oxo Compounds Supported on TiO₂ Photocatalysts for Waste Water Treatment T. Sirimahasal, S. Pranee, S. Chuayprakong, S. Durmus and S. Seeyangnok	108

Chapter 2: Nanomaterials and Nanotechnologies

Improved Synthesis Method of SiO₂@Ag Core-Shell for Detection of Toxic Metals in Water N. Youngwilai and S. Phongtamrug	115
Design of Experiment Approach for Fabrication Process of Electrospun Shellac Nanofibers Using Factorial Designs N. Chinatangkul, S. Pengon, C. Limmatvapirat and S. Limmatvapirat	120
Preparation of Magnetic Zinc Ferrite Nanoparticles and their Photocatalytic Performance C. Wongyara, P. Harnkar, C. Suwanchawalit, T. Puangpetch, K. Laohhasurayotin and A. Patil	125
Effect of Sulfuric Acid Treatment and Calcination on Commercial Zirconia Nanopowder M. Utami, K. Wijaya and W. Trisunaryanti	131

Chapter 3: Technologies in Area of Renewable and Alternative Energy

Experimental Study on the Performance of DMFC Using Novel Composite Materials of Polypyrrole-Coated Polypropylene as BPs R. Yeetsorn, C. Prapainainar, M.W. Fowler and Y. Maiket	141
Enhancement of Hydrogen Production from Sugarcane Bagasse by <i>Klebsiella pneumoniae</i> subsp. <i>pneumonia</i> DSM 30104(T) Using Statistical Methods P. Saraphirom, M. Teerakul and M. Anyabho	146
Enhancement of Enzymatic Hydrolysis of Lignocellulosic Materials by Nonionic Surfactant J. Parnthong, S. Kungsanan and S. Chavadej	151
Microwave Torrefaction of Moist Municipal Solid Waste (MSW) Pellets with the Addition of Char from Agricultural Residues P. Siritheerasas, P. Waiyanate, H. Sekiguchi and S. Kodama	156
Bioethanol Production from Ball-Milled and Regenerated Rice Husk S. Ouajai, R. Wanichayachart, T. Suksomprasong and A. Pisiswinyoo	161
Pyrolysis of Palm Oil in a Continuous Flow Microchannel Reactor K. Kun-as, L. Attanatho and P. Reubroycharoen	166
The Effect of Preparation Method on Ni/Ce/Al Catalyst for High Temperature Water-Gas Shift Reaction S. Sangsong, K. Srimala, M. Radonjic, S. Tungkamani, T. Sornchamni and M. Phongaksorn	171