

Table of Contents

Preface, Committees and Sponsors

Chapter 1: Multiscale Modeling and Simulation

Influence of Interphase Properties on the Macroscopic Response of Single- and Double-Walled CNT/Epoxy Nanocomposites: A Numerical Study D. Weidt, Ł. Figiel and M. Buggy	3
Micromechanical Modeling of the Effective Viscoelastic Response of Polyamide-6-Based Nanocomposites Reinforced with Modified and Unmodified Montmorillonite Clay K. Anoukou, F. Zaïri, M. Naït-Abdelaziz, A. Zaoui and J.M. Gloaguen	13
Design of High Thermal Conductivity Particle Filled Polymer Using Effective Thermal Conductivity Models B. Garnier and F. Danes	21
Multiscale Finite Element Modelling of Gallery Failure in Epoxy-Clay Nanocomposites C. Pisano, P. Priolo and Ł. Figiel	25
Multiscale Modeling Electrospun Nanofiber Structures A. Agić	33

Chapter 2: Design and Advanced Characterization

Photo-Induced Optical Anisotropy and Morphological Study in Azobenzene Containing Block Copolymers R. Fernández, I. Zalakain, J.A. Ramos, L. Martin and I. Mondragon	43
Determination of Phase Content in Multiphase Polymers by Solid-State NMR Techniques A. Martínez-Richa and R. Silvestri	51
Effects of Orientation on the Segmental Dynamics of Natural Rubber M. Hernandez, T.A. Ezquerro and M.A. López-Manchado	57
Phase Morphology and Molecular Structure Correlations in Model Fullerene-Polymer Nanocomposites D.G. Bucknall, G. Bernardo, M.L. Shofner, D. Nabankur, D. Raghavan, B.G. Sumpter, S. Sides, A. Huq and A. Karim	63
Low Frequency Relaxation in Block Copolymers and Nanocomposites A. Santamaria, M. Fernández and M.E. Muñoz	67
Elastomer Composites Containing Layered Fillers Modified with Ionic Liquids M. Lipinska, A. Laskowska and M. Zaborski	73
Investigation of Relaxation Processes in Nanocomposites by Transient Grating Experiments A. Taschin, P. Bartolini, A. Sánchez-Ferrer, R. Mezzenga, A. Mrzel and R. Torre	79
Crystallinity and Crystallization Kinetics in Poly(Ethylene Oxide)/Layered Silicate Nanocomposites H. Papananou, S. Fotiadou, K. Chrissopoulou and S.H. Anastasiadis	85
Surface Modification of Nanosilica for PP Composites J. Pelto, T. Munter, O. Härkki and J. Sarlin	91
Thermal Conductivity of Polymer/Carbon Nanotube Composites M. Haddadi, B. Agoudjil and A. Boudenne	99
Thermophysical and Radiative Properties of Conductive Biopolymer Composite Z. Antar, H. Noel, J.F. Feller, P. Glouannec and K. Elleuch	115
Mechanical, Structural and Diffusion Studies of Hydrogel Polyurethane Nanocomposites Containing Modified Montmorillonite J. Strankowska, M. Strankowski, Ł. Piszczek, J. Haponiuk and J. Kwela	123
Development and Characterization of 3D Nonwoven Composites M. Lewandowski, M. Amiot and A. Perwuelz	131

Thermal Conductivity and Mechanical Properties of Wood Sawdust/Polycarbonate Composites	
W. Wimonkong, P. Threepopnatkul and C. Kulsetthanchalee	139
Nanostructured Thermoset Composites Containing Conductive TiO₂ Nanoparticles	
J. Gutierrez, A. Tercjak and I. Mondragon	147
Conductive Properties of Inorganic/Organic Nanostructured Systems Based on Block Copolymers	
A. Tercjak, J. Gutierrez and I. Mondragon	153
The Effect of Carbon Fillers on Elastomer Composite Properties	
T. Pingot, M. Pingot and M. Zaborski	159
Smart Materials Based on Magnetorheological Composites	
M. Masłowski and M. Zaborski	167
Properties of POSS/HNBR Elastomer Nanocomposites	
A. Kosmalska, A. Strąkowska and M. Zaborski	175
Silsesquioxanes as Modifying Agents of Methylvinylsilicone Rubber	
A. Strąkowska, A. Kosmalska and M. Zaborski	183

Chapter 3: Processing, Application and Recycling

Electrical and Mechanical Properties of Ethylene Vinyl Acetate Based Composites	
K. Czaniková, Z. Špitalský, I. Krupa and M. Omastová	193
The Mechanical and Thermal Properties of Polyoxymethylene (POM)/Organically Modified Montmorillonite (OMMT) Engineering Nanocomposites Modified with Thermoplastic Polyurethane (TPU) Compatibilizer	
A. Leszczyńska and K. Pielichowski	201
Interfaces in Multiphase Polymers and Nanomedicines	
G. Patyi, Z. Nagy, B. Vajna, P. Anna and G. Marosi	211
Incorporation of Organomodified Layered Silicates and Silica in Thermoplastic Elastomers in Order to Improve Tear Strength	
O. Jaudouin, J.J. Robin, D. Perrin, R. Sonnier, P. Ienny, R. Léger and J.M. Lopez-Cuesta	217
Bioactivity of Fibrous Polymer Based Nanocomposites for Application in Regenerative Medicine	
E. Stodolak-Zych, A. Góra, Ł. Zych and M. Szumera	229
Development of Bio-Composites Based of Polymer Matrix and Keratin Fibers: Contribution to Poultry Biomass Recycling	
A. Salhi, S. Kaci and A. Boudenne	237
Polymer Nanocomposite Scaffolds Modified with Carbon Nanotubes for Tissue Regeneration	
A. Fraczek-Szczypta, E. Stodolak-Zych, S. Jurdziak and M. Blazewicz	245
Recycled Carbon Fibres: Contact Angles and Interfacial Bonding with Thermoset Resins	
G.Z. Jiang and S.J. Pickering	255
<i>In Vitro</i> Drug Release Activity from Core/Shell Electrospun MATS of sPLA-cPEG/GS and sPLA/CA-cPEG/GS	
K. Vichitchote, P. Threepopnatkul, S. Suttiruengwong and C. Kulsetthanchalee	263
The Influence of Nanostructured Metal Oxides and Unsaturated Acids on Peroxide Cross-Linking of Ethylene-Octene Rubber	
M. Pingot, T. Pingot, M. Maciejewska and M. Zaborski	271
Silica-Polyester Nanocomposites Prepared by Polycondensation <i>In Situ</i>: Synthesis and Mechanical Properties	
M. El Fray, M. Rybko and A. Piegat	277
<i>In Vitro</i> Degradation of β-Tricalcium Phosphate Reinforced Poly(L-Lactic Acid)	
A. Adamus, J. Jozwiakowska, R.A. Wach, D. Suarez-Sandoval, K. Ruffieux and J.M. Rosiak	283
Modification of Hydroxyapatite with Polymer Brushes	
B. Włodarczyk, J. Pietrasik and M. Zaborski	291