

Table of Contents

Preface

Chapter 1: Materials and Technologies for Fibers and Fabrics Fabrication

Orange Waste Films as a Raw Material for Designing Bio-Based Textiles: A Hybrid Research Method

D. Dumitrescu, M. Kooroshnia, S. Syed and A. Zamani 3

Evaluation of Denim Fabric Performances from Sustainable Yarn

O. Babaarslan, A. Shahid and S. Dilek 15

Influence of Fabric Structure on the Adhesion and Functional Properties of 3D Printed Polymers on the Woven Fabric

M. Čuk, K. Gramc, D. Muck and M. Bizjak 25

A Preliminary Study of Analysing Weft Cover Factor of Woven Fabrics by Image Treatment

I. Montava, P. Díaz-García, A. Carbonell, J. Gisbert-Payá and E. Bou-Belda 35

Chapter 2: Fabrics and Fibers for Biomedical Application

Exploring Nanofibers and Hydrogels as Collagenase Carriers for the Development of Advanced Wound Dressings

J. Antunes, A. Ribeiro, D. Lemos, T. Miranda, J. Santos and G. Soares 43

Preliminary Studies on Antimicrobial Properties for Nanofiber Air Filters

F.A.P. Scacchetti, D.S. de Almeida, R. Santos, M.H.S. Santana, F.M. Bezerra, M. Lopes Aguiar and L.D. Martins 57

Antibacterial Nonwoven with Propolis for Use in Surgical Masks

N. Aral and I. Yigit 63

Electrospinning of Poly(Caprolactone)/Gelatin/Clindamycin Nanocomposites as an Antibacterial Wound Dressing

P. Mohamadi, G. Mirmoeini, H. Bahrami, E. Mohsenzadeh, C. Cochrane and V. Koncar 71

Development of Antimicrobial Polyester Fabric by a Green *In Situ* Synthesis of Copper Nanoparticles Mediated from Chitosan and Ascorbic Acid

B. Mehravani, A.I. Ribeiro, M. Montazer and A. Zille 83

Enhancing the Antimicrobial Efficacy of Polyester Fabric Impregnated with Silver Nanoparticles Using DBD Plasma Treatment

A.I. Ribeiro, B. Mehravani, C. Magalhães, T. Nicolau, L. Melro, R.D.V. Fernandes, V. Shvalya, U. Cvelbar, J. Padrão and A. Zille 91

Chapter 3: Fabrics and Fibers for Reinforcing of Composite Materials

Biologically Inspired Load Adapted 3D Textile Reinforcement Structures

D. Friese, L. Hahn and C. Cherif 101

Textile-Based 3D Truss Reinforcement for Cement-Based Composites Subjected to Impact Loading - Part II: *In Situ* Stress Analysis under Quasistatic and Dynamic Tensile Loading

H.L. Xuan, D.M.P. Vo, A. Nocke, C. Sennewald, G. Hoffmann and C. Cherif 111

Textile-Based 3D Truss Reinforcement for Cement-Based Composites Subjected to Impact Loading Part I: Development of Reinforcing Structure and Composite Characterization

D.M.P. Vo, C. Sennewald, A. Golla, M. Vorhof, G. Hoffmann, H.L. Xuan, A. Nocke and C. Cherif 121

Uni-Directional Tape Structures Consisting of Recycled Carbon Fibres and Polyamide 6 Fibers for High-Performance Thermoplastic Composites

M.F. Khurshid, M.M.B. Hasan, S. Hoebel, A. Abdkader and C. Cherif 133

From Grave to Cradle - Development of Weft Knitted Fabrics Based on Hybrid Yarns from Recycled Carbon Fibre Reclaimed by Solvolytic Process from of EOL-Components D. Rabe, M.M.B. Hasan, E. Hüntzsche, C. Cherif, Y. Murakami, L.M. Bao and K. Kajiwara	139
Low Twist Hybrid Yarns from Long Recycled Carbon Fibres for High Performance Thermoplastic Composites M.M.B. Hasan, S. Bachor, A. Abdkader and C. Cherif	147

Chapter 4: Dyeing, Surface and Fibers Treatment

Thermochromic Properties of Textile Fabrics D. Matsouka, S. Vassiliadis, S. Galata, D. Gkoutzeli and A. Çay	157
New Method for Prediction of Photochromic Textiles Fatigue Behavior U. Solanki, M. Viková and M. Vik	163
Polyester-Polyvinylalcohol Hydrophilization Strategies T. Miranda, C. Pinto, J. Santos and G. Soares	173
Investigation of the Dyeability Behaviors of Cotton Surfaces with Natural Dyes Extracted from Rubia Tinctorum and Reseda Luteola L. Plants G. Caliskan, P. Sezgin, E.D. Kocak, S. Altindere and O. Kosemek	181
Pre, Post and Meta Mordanting Recycled Cotton with Chitosan S. Uysal, E. Bou-Belda, M. Bonet-Aracil and J. Gisbert-Payá	189
Substrate Color Prediction through Active Monitoring of the Exhaustion Dyeing Process B. Alves, L. Silva, G. Soares and J. Santos	195
Durable Moisture/Thermal Management Self-Adhesive Coating for Polyester Fabric G. Xia and J.H. Xin	203
Extraction Optimization of <i>Sorghum vulgare</i> for Natural Wool Dyeing Applications N. Belino, E. Alves, E. Almeida, C. Gameiro, T. Rosado, L. Passarinha, E. Gallardo, M. Pinto and J. Rodilla	209

Chapter 5: Environmental Engineering in Textile Production

Secondary Raw Plastic Materials in Applied Design J. Frajová and A. Opálková Šišková	227
Direct and Reactive Dyes Recovery in Textile Wastewater Using Calcinated Hydrotalcite E. Bou-Belda, D. López-Rodríguez, B. Micó-Vicent and M. Bonet-Aracil	233
Polyamide 6.6 Degradation through Photo-Fenton Process E. Marcelino-Perez, M. Bonet-Aracil, E. Bou-Belda, A. Amat Payá, A. Arques Sanz and R. Vicente	243