

Contents

Part I Cellulose Fibers and Nanofibers

- 1 **Natural Fibres: Structure, Properties and Applications** 3
S. Thomas, S.A. Paul, L.A. Pothan, and B. Deepa
- 2 **Chemical Functionalization of Cellulose Derived from Nonconventional Sources** 43
V.K. Varshney and Sanjay Naithani
- 3 **Production of Flax Fibers for Biocomposites** 61
Jonh Foulk, Danny Akin, Roy Dodd, and Chad Ulven
- 4 **Cellulosic Bast Fibers, Their Structure and Properties Suitable for Composite Applications** 97
Malgorzata Zimniewska, Maria Wladyka-Przybylak, and Jerzy Mankowski
- 5 **Potential Use of Micro- and Nanofibrillated Cellulose Composites Exemplified by Paper** 121
Ramjee Subramanian, Eero Hiltunen, and Patrick A.C. Gane

Part II Cellulosic Fiber-Reinforced Polymer Composites and Nanocomposites

- 6 **Greener Surface Treatments of Natural Fibres for the Production of Renewable Composite Materials** 155
Koon-Yang Lee, Anne Delille, and Alexander Bismarck
- 7 **Nanocellulose-Based Composites** 179
Kelley Spence, Youssef Habibi, and Alain Dufresne

8	Dimensional Analysis and Surface Morphology as Selective Criteria of Lignocellulosic Fibers as Reinforcement in Polymeric Matrices	215
	Kestur Gundappa Satyanarayana, Sergio Neves Monteiro, Felipe Perisse Duarte Lopes, Frederico Muylaert Margem, Helvio Pessanha Guimaraes Santafe Jr., and Lucas L. da Costa	
9	Interfacial Shear Strength in Lignocellulosic Fibers Incorporated Polymeric Composites	241
	Sergio Neves Monteiro, Kestur Gundappa Satyanarayana, Frederico Muylaert Margem, Ailton da Silva Ferreira, Denise Cristina Oliveira Nascimento, Helvio Pessanha Guimarães Santafé Jr., and Felipe Perissé Duarte Lopes	
10	The Structure, Morphology, and Mechanical Properties of Thermoplastic Composites with Lignocellulosic Fiber	263
	Slawomir Borysiak, Dominik Pauksza, Paulina Batkowska, and Jerzy Mańkowski	
11	Isora Fibre: A Natural Reinforcement for the Development of High Performance Engineering Materials	291
	Lovely Mathew, M.K. Joshy, and Rani Joseph	
12	Pineapple Leaf Fibers and PALF-Reinforced Polymer Composites	325
	S.M. Sapuan, A.R. Mohamed, J.P. Siregar, and M.R. Ishak	
13	Utilization of Rice Husks and the Products of Its Thermal Degradation as Fillers in Polymer Composites	345
	S.D. Genieva, S.Ch. Turmanova, and L.T. Vlaev	
14	Polyolefin-Based Natural Fiber Composites	377
	Santosh D. Wanjale and Jyoti P. Jog	
15	All-Cellulosic Based Composites	399
	J.P. Borges, M.H. Godinho, J.L. Figueirinhas, M.N. de Pinho, and M.N. Belgacem	
Part III Biodegradable Plastics and Composites from Renewable Resources		
16	Environment Benevolent Biodegradable Polymers: Synthesis, Biodegradability, and Applications	425
	B.S. Kaith, Hemant Mittal, Rajeev Jindal, Mithu Maiti, and Susheel Kalia	

17 Biocomposites Based on Biodegradable Thermoplastic Polyester and Lignocellulose Fibers	453
Luc Avérous	
18 Man-Made Cellulose Short Fiber Reinforced Oil and Bio-Based Thermoplastics	479
Johannes Ganster and Hans-Peter Fink	
19 Degradation of Cellulose-Based Polymer Composites	507
J.K. Pandey, D.R. Saini, and S.H. Ahn	
20 Biopolymeric Nanocomposites as Environment Benign Materials	519
Pratheep Kumar Annamalai and Raj Pal Singh	
 Part IV Applications of Cellulose Fiber-Reinforced Polymer Composites	
21 Cellulose Nanocomposites for High-Performance Applications	539
Bibin Mathew Cherian, Alcides Lopes Leao, Sivoney Ferreira de Souza, Sabu Thomas, Laly A. Pothan, and M. Kottaisamy	
22 Sisal Fiber Based Polymer Composites and Their Applications	589
Mohini Saxena, Asokan Pappu, Ruhi Haque, and Anusha Sharma	
23 Natural Fibre-Reinforced Polymer Composites and Nanocomposites for Automotive Applications	661
James Njuguna, Paul Wambua, Krzysztof Pielichowski, and Kambiz Kayvantash	
24 Natural Fiber-Based Composite Building Materials	701
B. Singh, M. Gupta, Hina Tarannum, and Anamika Randhawa	
About the Editors	721
Index	723