

SpringerBriefs in Molecular Science

Biobased Polymers

Series editor

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Published under the auspices of EPNOE**Springerbriefs in Biobased polymers* covers all aspects of biobased polymer science, from the basis of this field starting from the living species in which they are synthesized (such as genetics, agronomy, plant biology) to the many applications they are used in (such as food, feed, engineering, construction, health, ...) through to isolation and characterization, biosynthesis, biodegradation, chemical modifications, physical, chemical, mechanical and structural characterizations or biomimetic applications. All biobased polymers in all application sectors are welcome, either those produced in living species (like polysaccharides, proteins, lignin, ...) or those that are rebuilt by chemists as in the case of many bioplastics.

Under the editorship of Patrick Navard and a panel of experts, the series will include contributions from many of the world's most authoritative biobased polymer scientists and professionals. Readers will gain an understanding of how given biobased polymers are made and what they can be used for. They will also be able to widen their knowledge and find new opportunities due to the multidisciplinary contributions.

This series is aimed at advanced undergraduates, academic and industrial researchers and professionals studying or using biobased polymers. Each brief will bear a general introduction enabling any reader to understand its topic.

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Starch, Chitin and Chitosan Based Composites and Nanocomposites

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Abbreviations

AFM	Atomic force microscopy
AuNPs	Gold nanoparticles
Au@CDs-CS/GCE	Gold@carbon dots-chitosan-modified glassy carbon electrode
B.mori	Bombyx mori
CA	Citric acid
CCNGs	Curcumin-loaded chitin nanogels
CF	Coir fiber
CHNC	Chitin nanocrystals
CHNF	Chitin nanofibers
ChOx	Cholesterol oxidase
CMC	Carboxymethyl cellulose
CNT	Carbon nanotube
CNF	Cellulose nanofiber
CNP	Chitin nanoparticle
CNW	Chitin nanowhiskers
Cr(VI)	Chromium
CS	Chitosan
CZB	Chitosan hydrogel/nano zinc oxide composite bandages
α -chitin	Alpha chitin
β -chitin	Beta chitin
$^{\circ}\text{C}$	Degree Celsius
DMA	Dynamic mechanical analysis
DSC	Differential scanning calorimetry
dTG	Derivative thermogram
ECM	Extracellular matrix
E.coli	Escherichia coli
EM	Elastic modulus
ENR	Epoxidized natural rubber
Fe_3O_4	Magnetite

γ -Fe ₂ O ₃	Maghemite
GeO ₂	Germanium dioxide
GPa	Giga pascal
GPS	Glycerol-plasticized potato starch
H	Gelatinization enthalpy
HA	Hydroxyapatite
ITO	Indium tin oxide
<i>L. monocytogenes</i>	<i>Listeria monocytogenes</i>
MC3T3-E1	Mouse osteoblastic cells
MgG	Magnesium gluconate
MgO	Magnesium oxide
MMT	Montmorillonite
MPa	Mega pascal
MTT	3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide
MWCNT	Multi-walled carbon nanotubes
μ m	Micrometer
N-chitin	Nano chitin gel
NFC	Nanofibrillar cellulose
NIH-3T3	Mouse embryo fibroblast cell line
nm	Nanometer
NP	Nanoparticles
OPEFB	Oil palm empty fruit bunch
PCC	Chitin-coated with polyaniline
PCL	Polycaprolactone
PEGDA	Polyethylene glycol diacrylate
PEO	Poly(ethylene oxide)
PHBV	Poly(3-hydroxybutyrate-co-3-hydroxyvalerate)
PHF	Pea hull fiber
PHFNW	Cellulose nanowhiskers from pea hull fiber
PLA	Poly(lactic acid)
PLGA	Poly(lactic-co-glycolic acid)
PMMA	Polymethylmethacrylate
PS/GO-n	Glycerol-plasticized pea starch/graphene oxide
PVA	Polyvinylalcohol
PVP	Poly(N-vinylpyrrolidone)
RCB	Bleached rice hull
RH	Rice hull
RHNF	Cellulose nanofibrils extracted from rice hull
S/CHNC	Starch/Chitin nanocrystal
S/CHNF	Chitin nanofiber-reinforced starch matrix
SCB	Sugarcane baggase
SEM	Scanning electron microscope
ST	Starch
SiO ₂	Silicon dioxide

SPI	Soy protein isolate
T _c	Crystallization temperature
TEC	Tri Ethyl Citrate
TEOG	Germanium tetraethoxide
TEM	Transmission electron microscope
TEMPO	2, 2, 6, 6-tetramethyl-piperidiny-1-oxyl
TGA	Thermogravimetric analysis
TiO ₂	Titanium dioxide
T _o	Onset temperature
T _p	Peak temperature
TPS	Thermoplastic starch
WPI	Whey protein isolate
wt%	Weight percentage
WVP	Water vapour permeability
WVTR	Water vapour transmission rate
w/w%	Weight/weight percent
ZnO	Zinc oxide
ZrO ₂	Zirconium dioxide