

Editorial

Environmental Friendly Polymer Materials for Sustainable Development

Aihua He,¹ Shaojun Li,² Jisheng Ma,³ and Zhou Yang⁴

¹ Key Laboratory of Rubber-Plastics (Ministry of Education), Qingdao University of Science and Technology, Shandong, Qingdao 266042, China

² Trent Biomaterials Research Center, Trent University, Peterborough, ON, Canada K9J 7B8

³ Department of Materials Engineering, Monash University, Melbourne, VIC 3800, Australia

⁴ Department of Materials Physics and Chemistry, School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing 100083, China

Correspondence should be addressed to Aihua He; aihuah@iccas.ac.cn

Received 22 April 2014; Accepted 22 April 2014; Published 29 April 2014

Copyright © 2014 Aihua He et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Environmentally friendly materials are among the most important materials because of the increasing environmental issues and depletion of petroleum oil. It is definitely necessary for both academic and industry to develop the environmental friendly polymers materials or “green materials.” The environmental friendly polymers contain polymers or their composites which are either biodegradable or biobased (from renewable resources). Their carbon-neutral lifecycle may reduce the emission of carbon dioxide and the dependence on petroleum-based materials and then reduce the human footprint on the environment.

In fact, significant achievements in this field have been obtained by chemists, physicists, and engineers who have recognized the importance of developing environmentally responsible materials.

In order to reduce the white pollution caused by non-biodegradable waste plastic packaging materials, in the paper entitled “Ingredient of biomass packaging material and compare study on cushion properties,” F. Li et al. reported one biomass cushion packaging material with straw fiber and starch. With the optimized ingredient, the compressive strength can reach 0.94 MPa. The biomass cushion packaging material can be an ideal substitute for plastic packaging materials such as EPS and EPE.

In the paper entitled “Potential of cellulose-based super-absorbent hydrogels as water reservoir in agriculture,” C. Demitri et al. developed a biodegradable superabsorbent

hydrogel based on cellulose derivatives for the optimization of water resources. The hydrogel could significantly increase the water retention capability of the soil, as well as prolonging the sustained release of water to the plants over time, without additional watering needed. Such findings suggest that the envisaged use of the hydrogel on a large scale might have a revolutionary impact on the optimization of water resources management in agriculture.

In the paper entitled “Preparation of polyaniline-doped fullerene whiskers,” B. Wang et al. reported a new method of preparation of polyaniline emeraldine base (PANI-EB) doped fullerene (C60) whiskers (FWs) by ultrasonication of the mixture of PANI-EB/NMP colloid and FWs suspension. The authors confirmed an interaction existing between PANI-EB and FWs and suggested that charge-transfer complex of C60 and PANI-EB was formed.

In the paper entitled “Totally ecofriendly synthesis of silver nanoparticles from aqueous dissolutions of polysaccharides,” M. A. Garza-Navarro et al. reported a totally ecofriendly synthesis of silver nanoparticles from aqueous dissolution of polysaccharides. The polysaccharide carboxymethyl cellulose coming from natural products showed fine green concept and minimized the environmental impact of the synthetic processes for the development of nanostructures.

In the paper entitled “Synthesis and application of a novel polyamide charring agent for halogen-free flame retardant

polypropylene,” J. Liu et al. reported a novel charring agent poly(p-ethylene terephthalamide) (PETA) for halogen-free flame retardant polypropylene. PETA could increase the thermal stability of the composite and present high efficiency as flame retardant synergist to decrease inflammability and improve security of the PP composites.

In the paper entitled “A comparative cytotoxic evaluation of acrylamide and diacetone acrylamide to investigate their suitability for holographic photopolymer formulations,” D. Cody et al. processed a comparative study investigating the holographic recording ability of the two photopolymers (diacetone acrylamide (DA) and acrylamide) in transmission mode. The results showed that the DA photopolymer was capable of reaching refractive index modulation values and should have the value of holographic application.

In the paper entitled “Preparation of higher molecular weight poly (L-lactic acid) by chain extension,” C. Liu et al. introduced the synthesis of high molecular weight poly(L-lactic acid) (PLA) with hexamethylene diisocyanate (HDI) as chain extender. The high molecular weight PLA from sustainable resource showed good mechanical properties, which can be widely used as environment-friendly package materials.

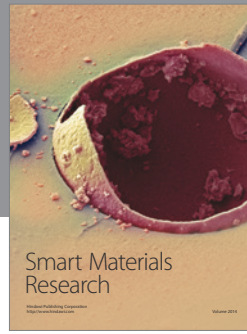
In the paper entitled “A nanocellulose polypyrrole composite based on tunicate cellulose,” D. Zhang et al. reported the production of a new functional material that exploits the inherent properties of tunicate cellulose (TC) from natural products by combination of the good electrical conductivity of polypyrrole (PPy). The material showed many excellent properties including high tensile strength, toughness, biocompatibility, high surface areas of the TC, and electronic and chemical properties of PPy.

In the paper entitled “Fourier transform infrared spectral analysis of polyisoprene of a different microstructure,” D. Chen et al. reported the analytic response to different microstructure contents from natural rubber trees including *cis*- and *trans*-1,4-polyisoprene based on the Fourier transform infrared (FTIR) spectrum. The variation of microstructure content in natural polyisoprenes can be determined by FTIR with good correlation.

Acknowledgments

The Editors thank all the contributing authors and reviewers for their efforts in putting together this special issue.

*Aihua He
Shaojun Li
Jisheng Ma
Zhou Yang*



Hindawi

Submit your manuscripts at
<http://www.hindawi.com>

