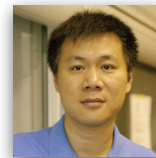


Editorial: Green polymers

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Green Materials was founded as a forum for the cross-disciplinary exchange of high-impact research articles, reviews and communications in the field of environmentally benign chemistry, materials and technologies. At *Green Materials*, we welcome submissions focused on synthesis, processing and properties of renewable and biodegradable polymers and sustainable polymer chemistry and engineering. Polymers not only become a part of almost every aspect of our lives but also play a critical role in building a sustainable future. The synthesis of polymers from biomass-derived monomers and CO₂ will reduce our reliance on fossil fuels and decrease carbon footprint. The development of polymers that are biodegradable and recyclable could accelerate our progress in recycling – only 8% of the total plastic waste generated in the USA was recycled in 2010, according to the US Environmental Protection Agency.

An ever-increasing focus on sustainability presents further opportunities for green materials including renewable and biodegradable polymers. As predicted in 2011 by the University of Applied Sciences and Arts at Hanover in Germany, global

production capacity of renewable polymers (Figure 1) will reach 1.7 million tons by 2015, more than doubling 2010 capacity levels. However, the challenges we are facing are also overwhelming: some critical issues related to cost and applications are yet to be addressed. On a fundamental level, there is critical need for the synthesis of new monomers and polymers derived from abundant renewable sources, development of polymerization and processing techniques that minimize waste and avoid routes that produce potentially harmful side products, demonstration of improved or even novel properties and functionalities of biodegradable polymers in comparison with their petroleum-based counterparts. Through the innovative research that is described in this journal, I believe we are well on our way.

This is the second thematic issue on “Next-Generation Renewable Polymers” based on the symposium co-organized by Prof. Chuanbing Tang, Prof. Marc Hillmyer and Prof. Geoffrey Coates at the American Chemical Society National Meeting in San Diego, CA, USA, on March 2012. Lignin, the second most abundant terrestrial biopolymer, is one of the most promising due to its sufficient supply, low cost

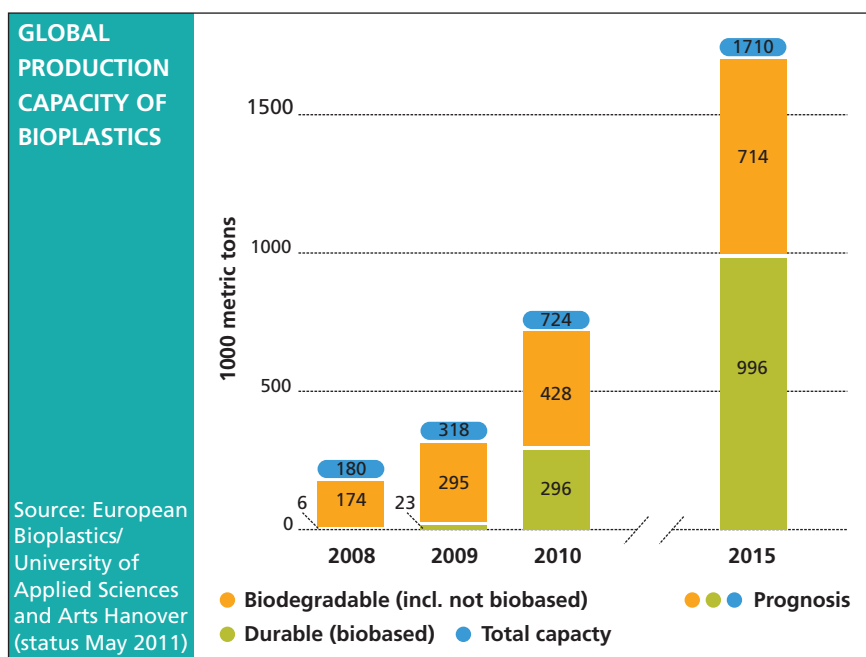


Figure 1. Global production capacity of bioplastics predicted by European Bioplastics/University of Applied Sciences and Arts Hanover.

and biodegradability. In their article, Prof. Washburn and his co-worker reviewed lignin-based copolymers and blends for a broad range of applications. Dr. Lewis and his research team described a green polymerization that greatly improved the sustainability of isobutene polymerizations by eliminating halogenated solvents, reducing energy consumption and removing the need for postpolymerization purification. Given well-known importance of polyisobutene in industry, the significance of this work is evident. The morphological structure, mechanical, dynamic mechanical and rheological properties of poly(lactic acid) (PLA)/soy protein concentrate (SPC) blends have been investigated by Prof. Zhang and his coauthors. They have demonstrated improved storage modulus of the resulting PLA/SPC blends at elevated temperatures through addition of water and increase of the SPC loading. Balaji and his coworkers from Manipal Institute of Technology, Manipal, India, systematically compared

the mechanical, morphological, thermal and hydrolytic properties of renewable, biobased resins prepared from starch, cellulose, lignin, chitosan, gelatin and their derivatives in their article. Dr. Mullen and his colleagues reported the synthesis and characterization of new superabsorbent polymers derived from naturally derived acrylates and methacrylates.

Apparently, the field of green polymers has been extremely active, crossing the boundaries of many traditional disciplines and steadily growing worldwide. *Green Materials* will continue to lead the way in publishing the high-quality research in this field to serve our broad and highly interdisciplinary community. Finally, let me take this time to thank all the authors and reviewers and the ICE Publishing staff who have gotten us off to such a quick and promising start.