

Introduction to Biopolymers and Bioplastics

by:

Robert Humphreys, Ph.D.

And

Jeffrey Gotro, Ph.D.



InnoCentrix, LLC
22431 Antonio Parkway, Suite B160-515
Rancho Santa Margarita, CA 92688
1-877-887-6596 (toll free)
Jgotro@innocentrix.com



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INTRODUCTION

Renewable technologies have been one of the hottest research areas for over a decade. Governments, angel investors, venture capitalists, and major corporations have invested huge sums in virtually every form of renewable energy, chemicals, and polymers. The driving force behind the investment surge is complex, including concerns about pollution and climate change, municipal waste disposal, dwindling fresh water supplies, the finite nature of fossil energy reserves, politics, and, not least, the potential to profit from successful commercialization of technology. Such funding largesse has fostered a plethora of start-up companies, university centers, consortia, institutes, and publications devoted to renewable technology R&D and commercialization.

The funding surge has also resulted in a vast and rapidly expanding literature on renewable technologies. Much of the literature is either academically or commercially focused, and it can be tedious and challenging to find information about the basics of renewable technologies. Jeff and I have a common interest in renewable materials, which prompted us to write a series of weekly blog articles about key aspects of the raw materials, chemistry, properties, production technologies, and applications of renewable polymers and bioplastics. Our objective was to provide focused, readable articles about the technology and commercial application of renewable polymers, starting from biomass in farmers' fields and extending through the final step in the process, when you place the empty soda pop bottle in the recycle bin. We diligently avoid controversial topics, such as comparing "greenness" of various technologies, but do discuss important technical challenges, such as what often is referred to as "the hydrogen problem". This eBook is a compilation of our blog posts over several years. The book includes illustrations, chemical structures and equations where appropriate, and, for many chapters, a list of readily available references for readers interested in further information.

We have organized this book into seven sections:

- ✓ Sustainability
- ✓ The Market
- ✓ The Biomass Supply Chain
- ✓ Bioplastics
- ✓ From Biomass to Beverage Bottles: An Example of an Application
- ✓ Thermoset Polymers
- ✓ Prospects for the Future

We hope readers find the book to be a valuable introduction to renewable polymers and bioplastics and possibly also a useful and convenient teaching tool.