

Preface

I was approached by a representative of De Gruyter in early February of 2022 to develop a book on Bioproducts for the Emerging Green and Sustainable Economy, covering this vast subject from discovery research to commercialization. My initial reaction was this is a daunting task given the broad scope and global nature of the field. I reached out to a few of my fellow practitioners in the field that I have known and worked with for the last two decades. There was some skepticism from a few of them. However, the overall feedback was quite positive and encouraging. I got back to the representative and submitted an outline for the book which was accepted. The focus of the outline was on bioproducts, excluding biofuels and bioenergy, derived from biomass and or produced by biological processing and/or conventional catalytic thermal chemical processes.

To manage a reasonably credible treatment of the enormous scope, I steered toward recruiting researchers and active stakeholders in the field that I have worked with closely. I also tried to reach out to my expert colleagues in Europe, Asia, Canada, South America, and India, as the field of Bioproducts is truly global in nature. To my pleasant surprise, most of them enthusiastically volunteered to submit a chapter on a topic directly aligned with the scope of the book. So, we have 26 chapters covering major all industrial sectors and applications in the book because of their contributions. The book is organized into six sections.

The first section has an introduction and an overview along with general discussion on biomass sources, process schemes, and techno-economic analysis useful in project selection. Also included is a primer for budding entrepreneurs with mostly R&D background, who need financial tools and awareness for raising needed funding.

The second section is focused on early-stage R&D projects covering the diverse areas of biosurfactants, bio-lubricants, microbial-derived bioproducts, novel formaldehyde-free binders from furanic building blocks, bio-solvents, and value-added products from lignin.

The third section covers emerging synthetic biology and biomanufacturing to develop and commercialize high-value products in myriad applications such as nutraceuticals, food additives, and others. Due to the great interest and attendant activities in this area, it was well beyond the scope of this book to cover this particularly important topic comprehensively.

The fourth section covers a few recently commercialized bioproducts – microbial biosurfactants, bioplastcizers for polyvinyl chloride (PVC), soy-based additives for the construction industry, and emerging green hydrogen. There are many other new bioproducts for cosmetic, personal care, chemical intermediates, etc. that have been commercialized. However, inclusion of all of them was outside the scope of the book. Again, as noted above, the selection of the few highlighted new products in this section was based on the editor's direct involvement in their product development.

The fifth section is focused on bioplastics and biopolymers, a vast and growing field covering myriad industries and applications. The subject is covered by the contributing authors from their perspectives and viewpoints. One challenge is avoiding repetition and coverage of closely related subject matter. A serious attempt has been made to minimize this issue.

The sixth and concluding section covers biocomposites, a growing field with applications in building and construction, auto and transportation, turbine blades for wind power generation, and biomedical devices and implants.

I owe my deep sense of appreciation and thanks to all the contributors. They have been extremely generous with their time and made a sincere effort to keep a tight schedule.

I also would like to thank Dr. Blaine Metting, a former colleague at Battelle, for his support and guidance. My thanks also to Dr. Roger Wyse of Spruce Capital, Mr. Andy Shaffer of Shafer Biz Associates, Dr. Damiano Beccaria of Eastman Chemicals, and my good friend Mr. Freddy Shleih of Fraunhofer IKTS for their support.

One person that I owe a great thanks to is Ms. Ria Sengbusch of De Gruyter for her timely help and feedback during the entire book project.

I also would like to thank my grandkids – Isla, Ian, Molly, and Gus – representing the next generation, for helping me select the book cover.

Overall, this has been a fulfilling and interesting experience over the last twelve months. It was great to connect with former colleagues and coworkers in developing the book. Finally, the responsibility for any inadvertent errors and omission of certain topics and their treatment is entirely on my shoulders. I would love to hear from the readers.

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