

Preface

This book has grown from a mini-review on lignin that we had published in 2010, by invitation from Sarah Higginbotham (nee Hall) at John Wiley & Sons Publishing Group. From the very outset, it was clear to us that tackling the project as authors of a complete work was the most challenging but nevertheless the most robust way of addressing the issue. Conceiving a whole book appeared to be more complete than the common compilation books where the monograph results from the contribution of various authors coordinated by an editor. In our opinion, although these compilation-type books often result in a series of very specific chapters that provide a collection of review articles of high scientific level, they usually lack a strength thread to unify the entire work.

The specific case of lignin is particularly challenging due to the enormous amount of information available, the abundance of undefined concepts, and the diverse areas of knowledge involved in the topic. Native lignin is studied by botanists for its role in plants and plant cells, by biochemists regarding biosynthesis, by chemists concerned with its structure, and even by engineers dealing with lignin coming from paper mill or biorefineries.

A similar situation involves lignans, where these secondary plant metabolites are studied also by botanists, chemists, and even by professionals in biomedical sciences for the biological properties of these molecules in living organisms. A fairly complete description of the nature, structure, properties, synthetic processes, and applications of this family of compounds is provided.

Given such a complex and multidisciplinary outlook, a thorough review was needed of the existing literature, together with classical references, the brainchild of pioneering authors, as well as recent contributions to the topic in order to provide the reader with a broad view of the most comprehensive knowledge on lignin and lignans. As is inevitable with projects of this scope, the final work might not be as complete as it could have been, but we nevertheless trust that the result is thorough enough to be useful to the scientific community interested in the subject.

Throughout the text, lignin is explained from different perspectives, including its role as a structural component of plants, and how it is produced as a by-product of paper industry and a product of biorefineries. Structural models of this biopolymer are disclosed, as well as the developing process that these models have undergone through the years, parallel to the improvement of structural determination methods, both instrumental and chemical ones. This information will provide the reader with an overall idea of the structure of lignin, its origin, its function, its applications, and its potential. The reader will also learn how to appropriately use the term "lignin," as the actual lignin depends on the origin of this material.

During the preparation of the book, special effort was made to review the applications and the potential uses of different lignins, with emphasis on the word "potential." So far, there has been ample academic work on the subject, but the actual results are still relatively modest. Therefore, many topics remain to be developed in the coming years, and they definitely will be, considering the growing importance of renewable raw materials in taking over those of limited availability.

Given our input on lignin, and our experience as authors of the present work, we conclude that this is a highly promising biomaterial, which, in terms of science and technology, still presents many unresolved issues that continue to be investigated. In the literature, terms such as "potential" and

"promising" constantly appear, alongside "difficult," "complex," and "underutilized." These modifiers reflect lignin's state of the art. In the coming years, great effort must be needed to ensure lignin the central role as source of raw materials, consumer goods, and much more relevant applications that it deserves. We deeply hope that this book will stimulate further interest and research in this promising biopolymer in its various forms.

Finally, we repeat our appreciation to John Wiley & Sons Publishing Group and its staff for their incalculable help, support, and feedback over the course of the project. Last but not least, we would like to give our special thanks to Dr Ángel Sánchez-González for the design of the front cover, and Mr David Nesbitt for his invaluable work on the revision of the English version of the manuscript and his contribution with the "*Podophyllum peltatum*" illustration.

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