

Book Review on “An Introduction to Electrospinning and Nanofibers”

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This book by Ramakrishna et al. on electrospinning deals with different aspects of the highly topical processing technique electrospinning and other issues related to nanofibers, which is an emerging field of nanotechnology. The book consists of 7 main chapters, an appendix for glossary terms and useful websites, a bibliography, and an index. Chapter 1 gives an introduction to the field of nanofibers and a short comparison of different techniques of making electrospun fibers. In chapter 2, basic relevants to electrospinning are explained including fundamentals of polymers (classification, polymer molecular weight, polymer crystallinity etc.), including an overview of electrospun polymer systems. This chapter also covers fundamentals and overviews for composites, ceramics, solution properties, polymer solubility, viscosity, volatility, solution conductivity, and electrostatics including considerations for electrical fields. In chapter 3, the electrospinning process itself is described in detail, with emphasis on the impact of different parameters on the electrospinning process and different fiber types possible. In chapter 4, modelling of the electrospinning process is discussed including future trends and challenges. Chapter 5 covers characterization of electrospun fibers. Chapter 6 is concerned with different methods of functionalization of electrospun fibers mostly by post-spinning techniques, including physical and chemical treatments. Chapter 6 also addresses the functionalization of electrospun fibers for various applications including affinity membranes, protective clothing, tissue engineering, sensors, etc. Concluding in chapter 7, potential applications of electrospun fibers are presented including drug release, wound dressing, filter media, energy and electrical applications, composite reinforcement, etc.

The highly progressing field of electrospinning is covered comprehensively until 2005, when it was published. Naturally, the manifold recent developments cannot be addressed but the book gives a rather complete overview on the most important issues of electrospinning. It nicely summarizes many different aspects of this highly topical field. Particularly valuable is the direct comparison of the results of different contributions, e. g. the impact of different spinning parameters. The extensive discussion on applications of electrospun fibers and their future potential for applications will be certainly motivation for others to enter field of electrospinning. Although the book addresses highly scientific and technical issues, it will be valuable for students coming different fields as well as the highly scholarly since many basic terms are explained.

Missing in the book is an overview on the historical development of electrospinning, which is quite unique as well as an overview on the patent situation, which is increasingly important in view of the numerous potential filings. Furthermore, basic terms are in some cases explained redundantly in the book. The usage of the term nanofibers for electrospun fibers throughout the book is kind of misleading and should have been avoided. Another concern is the term fiber spinning itself. The authors should have taken the opportunity to point out that electrospinning is more a coating technique rather than a true fiber spinning technique, although the border line here is quite narrow - at least coverage of this issue would contribute to the completeness of the book.

In spite of these minor complaints, the book should be ready to use on the desk of everybody who is in the field of electrospinning or wants to enter this field, regardless of whether in teaching or research.

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Editor: We cordially invite you to share your thoughts on electrospinning and nanofibers. Please submit your comments and letters to the editor at <http://jeff.edmgr.com>.