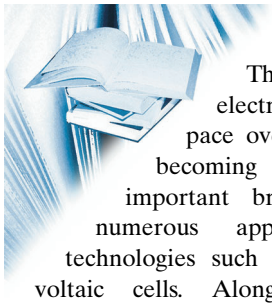


Polymer Electronics

The field of polymer electronics has developed at pace over the last few decades, becoming a highly topical and important branch of science with numerous applications in flexible technologies such as displays and photovoltaic cells. Alongside this growth in research has been the concurrent initiation of new courses aimed at teaching the key subjects required to gain an understanding of this field. One crucial shortcoming towards this goal has been the lack of a suitable text to accompany a lecture series. Mark Geoghegan and Georges Hadziioannou aim to address this issue in their textbook, *Polymer Electronics*, which provides a broad introduction to this fascinating area of science.

My own research group has developed into a strategic mix of people working and being trained in synthesis, materials analysis, and device physics and characterization. I thought it appropriate therefore for the research group to study the text and feed back their thoughts, especially since the book is aimed at early career researchers and masters students working or studying in plastic electronics. After several weeks the book was returned to me in a thoroughly worn state, demonstrating that the postgraduate students and postdoctoral workers had seriously vetted the content. Their general feedback was highly positive and I expect that the book will be frequently used and referred to in subsequent theses. The following observations and comments have been extracted from the overall feedback from my group.

Following a general introduction to polymer electronics in Chapter 1, including their history and highlighting potential future applications, the authors provide a more intensive introduction to the fundamentals of the field. Chapter 2 explains some of the foundations of electronic structure and band theory using polyacetylene as an example, including the formation of energy bands and doping, while Chapter 3 introduces and discusses more sophisticated examples of polymers. Chapters 4 and 5 discuss "Optoelectronic Properties" and "Charge Transport", providing a more detailed introduction to topics such as aggregation, electroluminescence, time-of-flight measurements, and charge injection. The synthesis and design of conjugated polymers is discussed in Chapter 6, covering the synthetic protocols and providing the basics for understanding how such materials are created. Chapters 7 and 8 cover related themes, namely "The Physics of Polymers" and "Surfaces and Interfaces", including polymer crystallinity (or amorphousness), polymers on surfaces, film formation and techniques to analyze deposited materials. The book concludes with two chapters on polymer applications, introducing firstly transistors in Chapter 9, followed by light-emitting diodes and photovoltaics in Chapter 10. The authors detail the role functional polymers play in the current and likely future applications of these technologies. In line with the target audience, the authors have kindly provided exercises at the conclusion of each chapter (with answers at the end of the book), as well as suitable references for further reading.

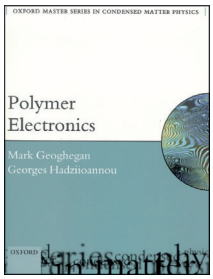
Most of the chapters in this book are well written and follow a logical order, as would be expected from an adapted lecture course, allowing the reader to build up a greater understanding as they read through the book. Each chapter covers a fairly broad range of topics in sufficient detail, providing a more complete appreciation of the area, and crucially resulting in several key themes contained within one text.

Although this book is appropriately targeted at senior undergraduates and Masters level students, particularly those studying physics and branches of materials science, in several sections the maths is demanding for those without a reasonable mathematical background. Another criticism is that the chemistry can feel a little neglected amongst so much physics. Indeed there are a few errors that have crept into the chemistry sections, such as missing atoms (e.g. p. 78), unbalanced equations (e.g. p. 110) and incorrect chemical structures (e.g. p. 126 and p. 137). However, the text serves as an introduction to the subject and further, more extensive details should be sought elsewhere; indeed the reader is directed towards other suitable texts (and reviews) at the conclusion to each chapter.

Overall, this text is a welcome addition that provides a concise introduction to this dynamic field of science. It is suitably targeted at students who are more advanced in their studies than those undergraduates fresh to university, and can either be consumed in one sitting or consulted for information on a specific topic. As such, I recommend *Polymer Electronics* to those with an interest in the field and those who are wishing to explore new territory.

Peter J. Skabara, Neil J. Findlay
Department of Pure and Applied Chemistry
University of Strathclyde (UK)

DOI: 10.1002/anie.201310074



Polymer Electronics
Oxford Master Series in Physics 22. By Mark Geoghegan and Georges Hadziioannou. Oxford University Press, 2013. 272 pp., softcover, £27.50.—ISBN 978-0199533831