Edited by Christoph Brabec,
Vladimir Dyakonov, Ullrich Scherf

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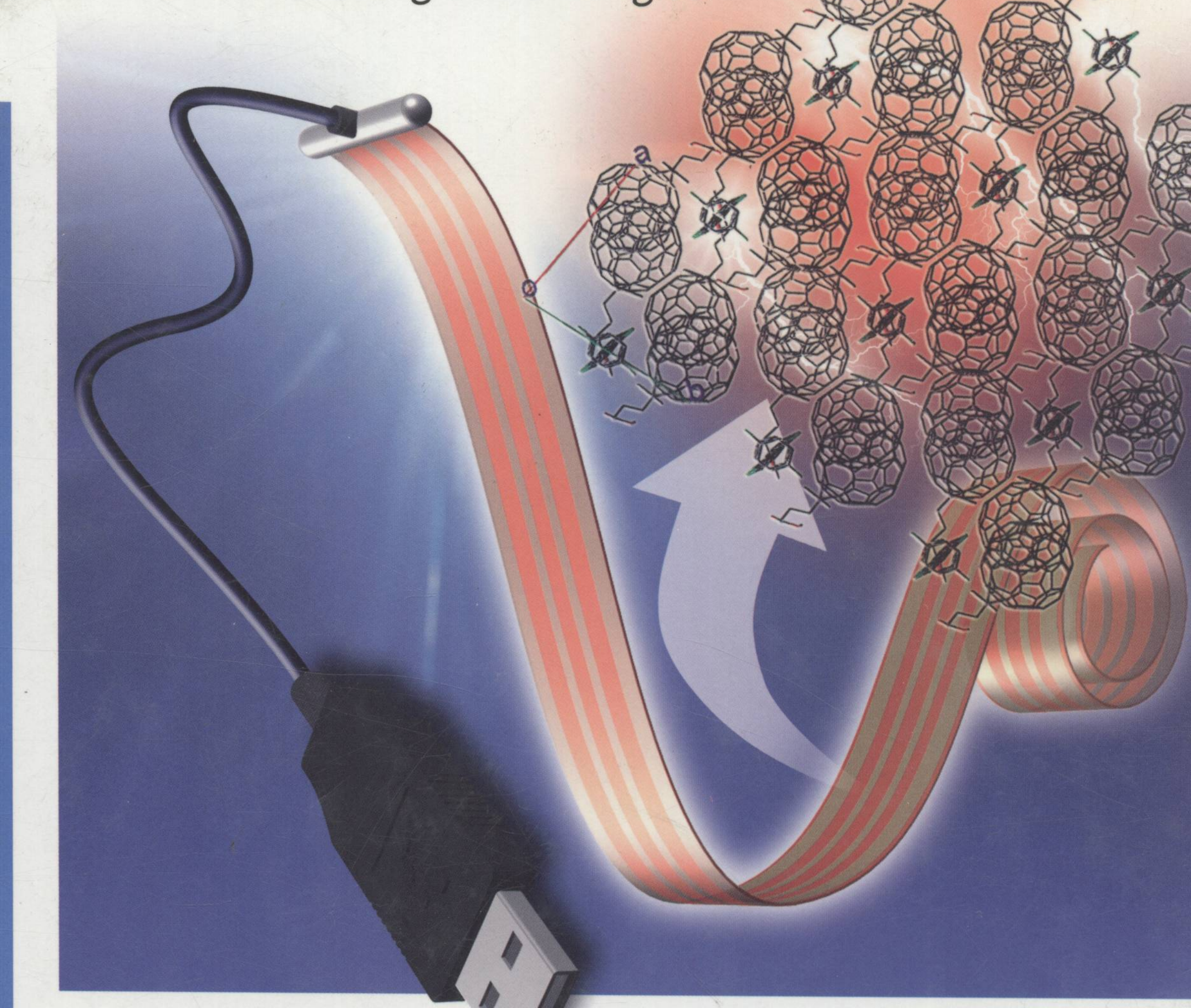
Materials, Device Physics, and Manufacturing Technologies



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Preface

In 2007 the Norwegian Nobel prize committee gave for the first time the Nobel Prize for Peace to a large scientific consortium, which aims at investigating and proving the rapid environmental and economical change in the earth's climate, also called global warming. Stabilizing the global climate requires an in depth modification of mankind's energy supply habits, and, this will require again a lot of energy. Solar radiation is the renewable energy source with practically unlimited access, attracting equal interest from both politicians and scientists. Today, large expectations are set in photovoltaics to become a major energy supplying technology before 2030.

The main attraction of organic solar cells is their compatibility to conventional printing and coating technologies. Among all photovoltaic technologies, organic solar cells are unique as they will be fabricated by printing or coating processes resulting in a true low cost technology.

World wide research in organic solar cells just started 10 years ago, and since then the number of publications is growing exponentially. Over the last 8 years, the number of papers on all aspects of organic solar cells has increased by about 65% per annum and in 2006, already 10% of the scientific publications in the field of photovoltaics reported on organic solar cells. The performance of organic solar cells was evolving constantly over the last few years, from approx. 1% in 2000 to >5% in 2007. Mastering the next big challenge, organic solar cells with up to 10% efficiency, requires the intensified exchange of knowledge and experiences between all the different scientific subdisciplines in a truly interdisciplinary approach involving materials chemistry, materials characterization, device physics, as well as device, process and production technology.

This book aims to contribute to this very important interdisciplinary information exchange and reviews latest developments in organic photovoltaics in the fields of materials, device physics/technology and production aspects. Despite this book mainly reports on materials and components suitable for solution (wet) processing,

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there is, of course, a clear commitment from the editors to the undoubtly high importance of dye sensitized and vacuum processed organic photovoltaic devices. The presentation and discussion of these and further promising concepts will be covered in a future edition of this book.

April 2008

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