materials, gases, liquids, and glasses, pointing out the absence of long-range symmetry.

From Chapter 19 onward, the book takes an eclectic approach, mixing chapters on some particular materials, silica and silicates (Chapter 19), and cement and concrete (Chapter 21), with chapters on fundamental properties and different materials as examples, such as an introduction to phase transformations (Chapter 20), surfaces and catalysis (Chapter 22), Neumann's Law and tensor properties (Chapter 23), thermal properties (Chapter 24), diffusion and ionic conductivity (Chapter 25), electrical conductivity (Chapter 26), optical properties (Chapter 27), dielectrics and ferroelectrics (Chapter 28), magnetism (Chapter 29), and mechanical properties (Chapter 30). For all of these chapters, the reasoning line is the symmetry and crystal structure properties, which are the basis for the physics and chemistry of the materials.

The authors rely heavily on figures (488) and tables (83) to teach how materials properties correlate with crystal structures. A table for the Shannon–Prewitt ionic radii is included as an appendix. Unfortunately, the book does not provide references to deepen the knowledge on the presented topics. Exercises are included in most chapters. Solutions are available online for teachers. Readers will profit from a basic knowledge of matrices and simple three-dimensional geometry. A computer program to draw structures will help to learn and visualize the many examples. This book is for undergraduate students or first-year graduate students, but anyone who researches and works with materials will profit from reading this excellent textbook.

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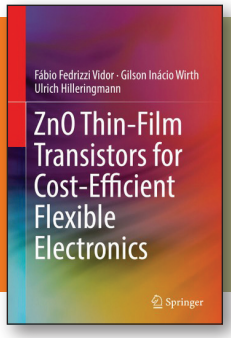

ZnO Thin-Film Transistors for Cost-Efficient Flexible Electronics

Fábio Fedrizzi Vidor, Gilson Inácio Wirth, and Ulrich Hilleringmann

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Flexible electronics is a technology for assembling electronic circuits by mounting electronic devices on flexible substrates. Flexible electronic assemblies may be manufactured using identical components for rigid printed circuit boards, allowing the board to conform to a desired shape or to flex during its use. ZnO is a typical Group II–VI semiconductor, with a wide bandgap and high transparency in the visible region. ZnO is very promising as an active channel layer for thin-film transistors (TFTs). In particular, ZnO TFTs are ideal candidates for producing transparent and flexible electronic products.

This book provides an introduction to ZnO TFTs for flexible electronics. It comprises seven chapters. Chapter 1 gives a brief introduction to flexible electronics and ZnO TFTs, as well as the flow of the book. Chapter 2 illustrates the fundamentals of flexible electronics, with an emphasis on ZnO TFTs. Chapter 3 is devoted to the fabrication processes of transistors on solid and flexible substrates, with a general overview of the most used techniques and materials. Chapter 4 discusses the electronic characterization of flexible ZnO TFTs, where along with the current–voltage curves, the TFT behaviors are analyzed in detail. Chapter 5 addresses the performances of circuits integrated with ZnO-based TFTs, including ZnO TFTs and InGaZnO TFTs. Chapter 6 includes improvements for integrated circuits and devices, including the implementation of complementary devices with *n*- and *p*-type TFTs. Chapter 7 presents future perspectives for flexible electronics based on ZnO TFTs.

This book provides a general understanding of flexible electronics and progress of ZnO-based TFTs in the field. For flexible electronics, ZnO-based amorphous semiconductors, such as InGaZnO and ZnAlSnO, have attracted more attention in recent years, which may have great potential for practical applications in transparent and flexible electronics. Transparent, flexible electronics can be considered the next generation of microelectronics, which is still a growing field and in its early stage of development. In this regard, the book gives us an excellent introduction of flexible electronics based on ZnO TFTs. However, the book could improve if more recent achievements on amorphous oxide semiconductors were included.

The authors have compiled information on a set of ZnO-based TFTs for flexible electronics. The contents are well organized and presented. This book is recommended to postgraduate students, researchers, and technologists, especially those who are interested in microelectronics, photonics, and optoelectronics, as well as printed electronics, transparent electronics, and flexible electronics.

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