

Book review

Springer Handbook of Materials Measurement Methods, H. Czichos, T. Saito, L. Smith (Eds.). Springer Science, Business Media Inc. (2006). 1208 p., 970 illus., €249, ISBN-10: 978-3-540-20785-6

The Springer Handbook of Materials Measurement Methods provides on 1208 pages a concise compilation from more than 100 leading experts in the fields of physics and engineering from all over the world. The book is divided into five parts and an appendix.

Part A describes the basic elements of metrology, the system which allows measurements made in different laboratories to be confidentially compared. The process of making measurements is analysed comprehensively and methods for estimating the uncertainty of measurements are provided.

Part B represents methods for the analysis of material composition and structure. The different chapters reveal the chemical composition, the nanoscopic architecture and microstructure and the surface and interface characterization.

Part C evaluates the methods of measuring the fundamental properties of materials. The chapters are concerned with mechanical, thermal, electrical, magnetic and optical properties of materials. The basics of the methods are introduced; advanced methods and their practical applications are described.

Measurement methods for material performance are described in Part D. These includes measurement of corrosion, friction and wear as well as biogenic impact on materials and more specific materials environment interactions. Methods for the characterization of safety and reliability are outlined.

Part E presents important modelling and simulation methods that underline measurement procedures that rely on mathematical models to interpret complex experiments or to estimate properties that cannot be measured directly.

In an appendix international standards of materials measurement methods are listed.

Materials are defined as substances constituting the physical matter of products, components and technical systems. The topics cover a broad range of methods for materials characterization and the claim as a handbook is appropriate. The methods are mainly addressed to solid materials and the main focus is on physical methods rather than chemical methods. The book is not specifically written for pharmaceutical scientists but is addressed to all scientists involved in materials. Thus, the descriptions are general and international standards are described. Methods published in the field of pharmaceutical sciences, e.g., by ICH or the pharmacopoeias are not mentioned in the handbook. Nevertheless, the handbook of materials measurement methods is of high value for all pharmaceutical scientists involved in the characterization of drugs, excipients, drug products, devices and packaging materials. The compilation of different methods is useful to provide alternative approaches for the characterization of certain material properties. The theoretical background of the methods as well as their applications is presented. Each of the 22 chapters has a comprehensive reference list. Due to the nature as a multi-author book the chapters are different in style and readability. In many cases it is evident that authors from America, Europe or Japan were mainly responsible for a chapter. The value of the different chapters for a specific scientist is strongly dependent on the personal interests. I recommend the Handbook of Materials Measurement Methods as a reference book of high value.

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