



(This book is collected by Kazi Md. Yakub,  
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## **Modern Textile Characterization Methods**

**INTERNATIONAL FIBER SCIENCE AND TECHNOLOGY SERIES**

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# **Modern Textile Characterization Methods**

edited by  
Mastura Raheel

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## Preface

New developments in fiber science and technology have resulted in fibers with tailored properties, thus expanding their uses beyond the domain of conventional textiles. The classical as well as nonclassical applications of fiber assemblies have placed stringent standards of performance that require precise monitoring of structure—property relationships in fibrous systems. These monitoring techniques must result in objective measurements that are based on sound scientific principles. A large body of knowledge exists on the physical, mechanical, and chemical properties of textiles/fiber assemblies. Also, standard methods have been developed by several national and international organizations such as the American Society for Testing and Materials (ASTM), the American Association of Textile Chemists and Colorists (AATCC), the European Standardisation Committee (CEN), the International Standards Organization (ISO), and others to assess fiber/textile physical, mechanical, chemical, and selected aesthetic properties.

Recently major strides have been made in the development and use of state-of-the-art engineering methods to characterize and assess the properties of polymers, single fibers, and textile assemblies at various stages of development, processing, manufacture, and end use. These methods are neither routinely used by the textile industry nor are all included in books dealing with standard test methods for fibers and textiles.

This volume attempts to bring together selected state-of-the-art methods, along with the scientific basis of these methods and their applications in the vastly diversified field of polymers, fibers, and textiles. Included in this volume are contributions by renowned researchers on polymer characterization methods such as

scanning and transmission electron microscopy (SEM and TEM), x-ray diffraction, differential scanning calorimetry (DSC), and nuclear magnetic resonance (NMR). This book also examines surface characterization of fibers using SEM; chromatographic techniques to identify fibers and evaluate internal pore volume in fibers and pore structure patterns in textiles with emphasis on their applications in dyeing, finishing, and composite-making technologies; micromasurement of single-fiber mechanical properties; objective measurement of fabric hand and its applications; color measurement and control; and methods for evaluating chemical and microbiological barrier properties of textiles.

It is hoped that this volume will fill the gap that exists between the currently employed standard methods for textile testing and the recent advances that have been made in methodology development to assess the characteristics of polymers, single fibers, fibrous systems, and associated processes. It is assumed that the readers are familiar with the fundamentals of fiber science and textile processes. The book should be very useful to those individuals and organizations involved with research and development, process control, and product analysis in the polymer, textile, and related industries. It is hoped this will serve as a valuable reference book for education and research in areas of polymers, textiles, and related sciences.

MASTURA RAHEEL



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