



Scanning Probe Microscopy for Industrial Applications: Nanomechanical Characterization

Dalia G. Yablon

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Describes new state-of-the-science tools and their contribution to industrial R&D

With contributions from leading international experts in the field, this book explains how scanning probe microscopy is used in industry, resulting in improved product formulation, enhanced processes, better quality control and assurance, and new business opportunities. Readers will learn about the use of scanning probe microscopy to support R&D efforts in the semiconductor, chemical, personal care product, biomaterial, pharmaceutical, and food science industries, among others.

Scanning Probe Microscopy for Industrial Applications emphasizes nanomechanical characterization using scanning probe microscopy. The first half of the book is dedicated to a general overview of nanomechanical characterization methods, offering a complete practical tutorial for readers who are new to the topic. Several chapters include worked examples of useful calculations such as using Hertz mechanics with and without adhesion to model a contact, step-by-step instructions for simulations to guide cantilever selection for an experiment, and data analysis procedures for dynamic contact experiments.

The second half of the book describes applications of nanomechanical characterization in industry, including:

- New formulation development for pharmaceuticals
- Measurement of critical dimensions and thin dielectric films in the semiconductor industry
- Effect of humidity and temperature on biomaterials
- Characterization of polymer blends to guide product formulation in the chemicals sector
- Unraveling links between food structure and function in the food industry

Contributions are based on the authors' thorough review of the current literature as well as their own firsthand experience applying scanning probe microscopy to solve industrial R&D problems.

By explaining the fundamentals before advancing to applications, *Scanning Probe Microscopy for Industrial Applications* offers a complete treatise that is accessible to both novices and professionals. All readers will discover how to apply scanning probe microscopy to build and enhance their R&D efforts.

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