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Nota di contenuto	Atomic Force Microscopy: Understanding Basic Modes and Advanced Applications; Contents; Preface; Acknowledgments; 1. Overview of AFM; 1.1. The Essence of the Technique; 1.2. Property Sensitive Imaging: Vertical Touching and Sliding Friction; 1.3. Modifying a Surface with a Tip; 1.4. Dynamic (or "AC" or "Tapping") Modes: Delicate Imaging with Property Sensitivity; 1.5. Force Curves Plus Mapping in Liquid; 1.6. Rate, Temperature, and Humidity-Dependent Characterization; 1.7. Long-Range Force Imaging Modes; 1.8. Pedagogy of Chapters; References; 2. Distance-Dependent Interactions 2.1. General Analogies and Types of Forces 2.2. Van der Waals and Electrostatic Forces in a Tip-Sample System; 2.2.1. Dipole-Dipole Forces; 2.2.2. Electrostatic Forces; 2.3. Contact Forces and Mechanical Compliance; 2.4. Dynamic Probing of Distance-Dependent Forces; 2.4.1. Importance of Force Gradient; 2.4.2. Damped, Driven Oscillator: Concepts and Mathematics; 2.4.3. Effect of Tip-Sample Interaction on Oscillator; 2.4.4. Energy Dissipation in Tip-Sample Interaction; 2.5. Other Distance-Dependent Attraction and Repulsion: Electrostatic and Molecular Forces in Air and Liquids 2.5.1. Electrostatic Forces in Liquids: Superimposed on Van der Waals

Forces 2.5.2. Molecular-Structure Forces in Liquids; 2.5.3. Macromolecular Steric Forces in Liquids; 2.5.4. Derjaguin Approximation: Colloid Probe AFM; 2.5.5. Macromolecular Extension Forces (Air and Liquid Media); 2.6. Rate/Time Effects; 2.6.1. Viscoelasticity; 2.6.2. Stress-Modified Thermal Activation; 2.6.3. Relevance to Other Topics of Chapter 2; References; 3. Z-Dependent Force Measurements with AFM; 3.1. Revisit Ideal Concept; 3.2. Force-Z Measurement Components: Tip/Cantilever/Laser/Photodetector/Z Scanner
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5.1. Phase Measurement as a Diagnostic of Interaction Regime and Bistability

Sommario/riassunto

This book enlightens readers on the basic surface properties and distance-dependent intersurface forces one must understand to obtain even simple data from an atomic force microscope (AFM). The material becomes progressively more complex throughout the book, explaining details of calibration, physical origin of artifacts, and signal/noise limitations. Coverage spans imaging, materials property characterization, in-liquid interfacial analysis, tribology, and electromagnetic interactions. "Supplementary material for this book can be found by entering ISBN 9780470638828 on booksuppo
