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Collana	Adhesion and Adhesives: Fundamental and Applied Aspects
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Nota di contenuto	Cover; Title Page; Copyright Page; Contents; Preface; Acknowledgements; Part 1: Adhesion: Fundamentals and Measurement; 1 Study of Molecular Bonding or Adhesion by Inelastic Electron Tunneling Spectroscopy, with Special Reference to Microelectronics; 1.1 Introduction; 1.2 Principles of IETS; 1.2.1 General Overview; 1.2.2 Key Principles of Operation; 1.2.3 IET Spectrometer Design and Implementation; 1.2.4 IET Sample Preparation; 1.3 Application of IETS in Microelectronics; 1.4 Prospects; 1.5 Summary; References; 2 Adhesion Measurement of Thin Films and Coatings: Relevance to Microelectronics 2.1. Introduction2.2 Mechanical Methods; 2.2.1 Commonly Used Qualitative or Semi-quantitative Methods; 2.2.2 Quantitative Methods; 2.3 Laser Based Techniques; 2.3.1 Laser Induced Delamination (LID); 2.3.2 Laser Direct Ablation Induced De-adhesion; 2.3.3 Laser Spallation Technique; 2.4 Summary and Remarks; References; Part 2: Ways to Promote/Enhance Adhesion; 3 Tailoring of Interface/Interphase to Promote Metal-Polymer Adhesion; 3.1 Introduction; 3.1.1 Role of

Surface Energy for Metal-Polymer Adhesion; 3.1.2 Physical Effects Produced by Covalent Bonding of Metal to Polymer
 3.1.3 Thermal Expansion Coefficients of Metals and Polymers
 3.1.4 Differences Between Al-Polyolefin and Polyolefin-Al Laminates; 3.1.5 Types of Covalent Metal-Polymer Bonds; 3.1.6 Redox Reactions across the Metal-Polymer Interface; 3.1.7 Reactions of Transition Metals with Aromatic Polymers; 3.1.8 Loss in Anisotropic Orientation of Polymers Caused by Pretreatment or by Contact with Metals; 3.1.9 Combination of Plasma Pretreatment and Metal Deposition; 3.1.10 Thermodynamics; 3.2 New Concepts for Ideal Design of Metal-Polymer Interfaces with Covalently Bonded Flexible Spacer Molecules
 3.2.1 Principal Functions of Spacers
 3.2.2 Ways to Graft Spacer Molecules onto Polyolefin Surfaces; 3.2.3 Grafting of Spacer Molecules onto Monotype Functional Groups at the Polyolefin Surface for Realizing New Interface Design in Metal-Polymer Systems; 3.3 Situation at Al Oxide/Hydroxide Surfaces Using Aluminium as Substrate; 3.4. Adhesion Promotion by Non-specific Functionalization of Polyolefin Surfaces; 3.4.1 General; 3.4.2 Introduction of Functional Groups onto Polyolefin Surfaces; 3.4.3 Usual Pretreatment Processes and Their Advantages and Disadvantages
 3.4.4 Use of Adhesion Promoting Layers Deposited by Plasma Polymerization
 3.4.5 Use of Silanes and Siloxanes; 3.4.6 Other Methods; 3.5 Methods for Producing Monosort Functional Groups at Polyolefin Surfaces; 3.5.1 Oxygen Plasma and Wet-chemical Reduction of O-functional Groups to OH Groups; 3.5.2 Underwater Capillary Discharge Plasma or Glow Discharge Electrolysis (GDE); 3.5.3 Electrospray-Ionization Deposition of Ultra-thin Polymer Layers; 3.5.4 Allylamine Plasma Polymerization for Producing NH₂ Groups; 3.5.5 Allyl Alcohol Plasma Polymerization for Producing OH Groups
 3.5.6 Acrylic Acid Plasma Polymerization for Producing COOH Groups

Sommario/riassunto

This comprehensive book will provide both fundamental and applied aspects of adhesion pertaining to microelectronics in a single and easily accessible source. Among the topics to be covered include; Various theories or mechanisms of adhesion
 Surface (physical or chemical) characterization of materials as it pertains to adhesion
 Surface cleaning as it pertains to adhesion
 Ways to improve adhesion
 Unraveling of interfacial interactions using an array of pertinent techniques
 Characterization of interfaces / interphases
 Polymer-polymer adhesion
 Metal-polymer adhesion (metallized polymers)
 Polymer adhesion