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Thermoplastics and Thermosets; 1.2 Processing of Thermoplastics and Thermosets; 1.3 Polymer Composites; 1.3.1 Types and Components of Polymer Composites; 1.3.2 Parameters Affecting Properties of Composites; 1.3.3 Effects of Fillers/Reinforcements: Functions; 1.3.4 Rules of Mixtures for Composites; 1.3.5 Functional Fillers; 1.3.5.1 Classification and Types  
1.3.5.2 Applications, Trends, and Challenges  
References; 2 Modification of Polymer Properties with Functional Fillers; 2.1 Introduction; 2.2 The Importance of the Interface; 2.3 Modification of Mechanical Properties; 2.3.1 General; 2.3.2 Modulus of Fiber and Lamellar Composites; 2.3.2.1 Continuous Reinforcements; 2.3.2.2 Discontinuous Reinforcements; 2.3.3 Modulus of Composites Incorporating Particulates; 2.3.4 Strength of Fiber and Lamellar Composites; 2.3.4.1 Continuous Reinforcements; 2.3.4.2 Discontinuous Reinforcements; 2.3.5 Strength of Composites Containing Particulates  
2.3.6 Toughness Considerations  
2.3.7 Temperature and Time Effects; 2.3.8 Other Properties; 2.3.8.1 Tribological Properties; 2.3.8.2 Permeability; 2.4 Effects of Fillers on Processing Characteristics of Polymers; 2.4.1 General; 2.4.2 Melt Rheology of Filled Polymers; 2.4.2.1 Concentration and Shear Rate; 2.4.2.2 Filler Size and Shape; 2.4.2.3 Filler Surface Treatments; 2.4.3 Processing/Structure/Property Relationships; References; 3 Mixing of Fillers with Plastics; 3.1 Introduction; 3.2 Pretreatment of Fillers; 3.3 Feeding; 3.4 Melting; 3.5 Solids Introduction and Mixing; 3.6 Venting  
3.7 Pressure Generation  
3.8 Process Examples; 3.9 Further Information; References; Part Two: Surface Modifiers and Coupling Agents; 4 Silane Coupling Agents; 4.1 Introduction; 4.2 Production and Structures of Monomeric Silanes; 4.3 Silane Chemistry; 4.4 Types of Silanes; 4.4.1 Waterborne Silane Systems; 4.4.2 Oligomeric Silanes; 4.5 Silane Hydrolysis; 4.6 Reactivity of Silanes Toward the Filler; 4.7 Combining Silanes and Mineral Fillers; 4.7.1 Method I; 4.7.2 Method II; 4.7.3 Method III; 4.7.4 Method IV; 4.8 Insights into the Silylated Filler Surfaces; 4.8.1 Spectroscopy  
4.8.1.1 FTIR/Raman Spectroscopy  
4.8.1.2 MAS-NMR Spectroscopy  
4.8.1.3 Auger Electron Spectroscopy; 4.8.2 Pyrolysis-Gas Chromatography; 4.8.3 Carbon Analysis; 4.8.4 Colorimetric Tests; 4.8.5 Acid-Base Titration; 4.8.6 Analytical Tests for Hydrophobicity; 4.8.7 Silane/Colorant Combined Surface Modification; 4.9 Selection of Silanes; 4.10 Applications of Specific Silanes; 4.10.1 Vinylsilanes; 4.10.2 Aminosilanes; 4.10.2.1 General; 4.10.2.2 Calcined Clay-Filled Polyamides; 4.10.2.3 ATH-Filled EVA; 4.10.2.4 MDH-Filled Polypropylene; 4.10.3 Methacryloxy silanes; 4.10.3.1 General  
4.10.3.2 Filled PMMA Resin Systems

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## Sommario/riassunto

A comprehensive and up-to-date overview of the major mineral and organic fillers for plastics, their production, structure and properties, as well as their applications in terms of primary and secondary functions. Edited and co-authored by Professor Marino Xanthos with contributions by international experts from industry and academia, this book presents methods of mixing/incorporation technologies, surface treatments and modifications for enhanced functionality, an analysis of parameters affecting filler performance and a presentation of current and emerging applications. Additionally, the nov

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