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Solubilization by Cosolvents; 1.4.4 Solubilization by Surfactants (Micellar Solubilization); 1.4.5 Solubilization by Combination of Approaches; 1.5 Experimental Determination of Solubility; 1.5.1 Stability of Solute and Solvent; 1.5.2 Shakers and Containers 1.5.3 Presence of Excess Undissolved Solute 1.5.4 Determination of Equilibrium; 1.5.5 Phase-separation; 1.5.6 Determination of Solute Content in the Dissolved Phase; 1.5.7 Experimental Conditions; Chapter 2. Crystalline and Amorphous Solids; 2.1 Introduction; 2.2 Definitions and Categorization of Solids; 2.3 Thermodynamics and Phase Diagrams; 2.3.1 Polymorphs; 2.3.2 Solvates/Hydrates; 2.3.3 Cocrystals; 2.3.4 Amorphous Solids; 2.4 Pharmaceutical Relevance and Implications; 2.4.1 Solubility; 2.4.2 Dissolution Rate and Bioavailability; 2.4.3 Hygroscopicity; 2.4.4 Reactivity and Chemical Stability 2.4.5 Mechanical Properties 2.5 Transformations Among Solids; 2.5.1 Induced by Heat; 2.5.2 Induced by Vapor; 2.5.3 Induced by Solvents; 2.5.4 Induced by Mechanical Stresses; 2.6 Methods of Generating the Solids; 2.6.1 Through Gas; 2.6.2 Through Liquid; 2.6.3 Through Solid; 2.7 Amorphous Drugs and Solid Dispersions; 2.7.1 Characteristics of Amorphous Phases; 2.7.2 Characteristics of Amorphous Solid Dispersions; 2.7.3 Crystallization of Amorphous Drug and Dispersions; 2.8 Special Topics; 2.8.1 Polymorph Screening and Stable Form Screening; 2.8.2 High Throughput Crystallization 2.8.3 Miniaturization in Crystallization Chapter 3. Analytical Techniques in Solid-state Characterization; 3.1 Introduction; 3.2 Review of Analytical Techniques and Methods; 3.3 Microscopic Methods; 3.3.1 Optical Microscopy; 3.3.2 Electron Microscopy; 3.4 Thermal Analysis; 3.4.1 Differential Scanning Calorimetry; 3.4.2 Thermogravimetric Analysis; 3.4.3 Microcalorimetry; 3.5 Diffraction Methods; 3.5.1 Single-crystal X-ray Diffraction; 3.5.2 Powder X-ray Diffraction; 3.6 Vibrational Spectroscopy; 3.6.1 Infrared Spectroscopy; 3.6.2 Raman Spectroscopy; 3.6.3 Near-infrared 3.7 Solid-State Nuclear Magnetic Resonance Spectroscopy

Sommario/riassunto

This book is intended for pharmaceutical professionals engaged in research and development of oral dosage forms. It covers essential principles of physical pharmacy, biopharmaceutics and industrial pharmacy as well as various aspects of state-of-the-art techniques and approaches in pharmaceutical sciences and technologies along with examples and/or case studies in product development. The objective of this book is to offer updated (or current) knowledge and skills required for rational oral product design and development. The specific goals are to provide readers with: Basics of modern
