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Spectrometry; 1.4.5 Analytical Ultracentrifugation; 1.5 Keynotes; 1.6 References; 2 Light Scattering; 2.1 Theory and Basic Principles; 2.2 Types of Light Scattering; 2.2.1 Static Light Scattering; 2.2.1.1 Particle Scattering Functions; 2.2.1.2 Light Scattering Formalisms; 2.2.1.3 Processing the Experimental Data; 2.2.2 Dynamic Light Scattering; 2.3 Light Scattering Instrumentation
2.4 Specific Refractive Index Increment2.5 Light Scattering in Batch and Chromatography Mode; 2.6 Parameters Affecting Accuracy of Molar Mass Determined by Light Scattering; 2.7 Examples of Light Scattering Measurement in Batch Mode; 2.8 Keynotes; 2.9 References; 3 Size Exclusion Chromatography; 3.1 Introduction; 3.2 Separation Mechanisms; 3.2.1 Steric Exclusion; 3.2.2 Restricted Diffusion; 3.2.3 Separation by Flow; 3.2.4 Peak Broadening and Separation Efficiency; 3.2.5 Secondary Separation Mechanisms; 3.3 Instrumentation; 3.3.1 Solvents; 3.3.2 Columns and Column Packing; 3.3.3 Detectors
3.3.3.1 UV Detector3.3.3.2 Refractive Index Detector; 3.3.3.3 Infrared Detector; 3.3.3.4 Evaporative Light Scattering Detector; 3.3.3.5 Viscosity Detector; 3.3.3.6 Light Scattering Detector; 3.3.3.7 Other Types of Detectors; 3.4 Column Calibration; 3.4.1 Universal Calibration; 3.4.2 Flow Marker; 3.5 SEC Measurements and Data Processing; 3.5.1 Sample Preparation; 3.5.2 Determination of Molar Mass and Molar Mass Distribution; 3.5.3 Reporting Results; 3.5.4 Characterization of Chemical Composition of Copolymers and Polymer Blends; 3.5.5 Characterization of Oligomers
3.5.6 Influence of Separation Conditions3.5.7 Accuracy, Repeatability, and Reproducibility of SEC Measurements; 3.6 Applications of SEC; 3.7 Keynotes; 3.8 References; 4 Combination of SEC and Light Scattering; 4.1 Introduction; 4.2 Data Collection and Processing; 4.2.1 Processing MALS Data; 4.2.1.1 Debye Fit Method; 4.2.1.2 Zimm Fit Method; 4.2.1.3 Berry Fit Method; 4.2.1.4 Random Coil Fit Method; 4.2.1.5 Influence of Light Scattering Formalism on Molar Mass and RMS Radius; 4.2.2 Determination of Molar Mass and RMS Radius Averages and Distributions; 4.2.3 Chromatogram Processing
4.2.4 Influence of Concentration and Second Virial Coefficient

Sommario/riassunto

A comprehensive, practical approach to three powerful methods of polymer analysis and characterization This book serves as a complete compendium of three important methods widely used for the characterization of synthetic and natural polymers-light scattering, size exclusion chromatography (SEC), and asymmetric flow field flow fractionation (A4F). Featuring numerous up-to-date examples of experimental results obtained by light scattering, SEC, and A4F measurements, Light Scattering, Size Exclusion Chromatography and Asymmetric Flow Field Flow Fractionation takes an all-in-one approach to