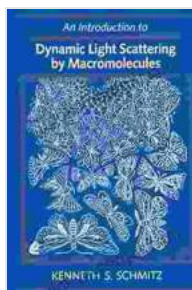


Unlocking the Secrets of Matter: An Introduction to Dynamic Light Scattering by Macromolecules

Dynamic light scattering (DLS), a powerful analytical technique, has revolutionized our understanding of the behavior of macromolecules in solution. This cutting-edge book, "Introduction to Dynamic Light Scattering by Macromolecules," provides a comprehensive guide to the principles, instrumentation, and applications of DLS, empowering researchers to delve into the fascinating world of macromolecular dynamics.

Chapter 1: Principles of Dynamic Light Scattering

This chapter lays the foundation of DLS theory. It explains the concepts of light scattering, Brownian motion, and the dynamic structure factor, providing readers with a solid understanding of the underlying principles. The chapter also discusses the relationship between the scattered light intensity and the particle size distribution, paving the way for practical applications.



Introduction to Dynamic Light Scattering by Macromolecules by Kenneth S Schmitz

★★★★☆ 4.5 out of 5

Language : English

File size : 44524 KB

Screen Reader : Supported

Print length : 472 pages

X-Ray for textbooks : Enabled

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Chapter 2: Instrumentation and Data Analysis

Chapter 2 guides readers through the complexities of DLS instrumentation. It covers various light sources, detectors, and experimental setups used in DLS measurements. The chapter also explores different data analysis methods, including cumulant analysis and CONTIN, enabling researchers to extract valuable information from experimental data.

Chapter 3: Applications in Polymer Science

This chapter delves into the wide-ranging applications of DLS in polymer science. It showcases how DLS can characterize polymer molecular weight, size distribution, and chain dynamics. The chapter explores the use of DLS in studying polymer blends, copolymers, and polymer thin films, providing insights into their structure and properties.

Chapter 4: Applications in Protein Science

Chapter 4 explores the applications of DLS in protein science. It highlights how DLS can determine protein hydrodynamic radius, aggregation behavior, and conformational changes. The chapter also discusses the use of DLS in studying protein folding, protein-protein interactions, and drug-protein binding.

Chapter 5: Applications in Nanotechnology and Colloids

This chapter explores the versatile applications of DLS in nanotechnology and colloids. It covers the characterization of nanoparticles, micelles, and vesicles using DLS. The chapter also discusses the use of DLS in studying the stability, aggregation, and surface properties of colloidal systems.

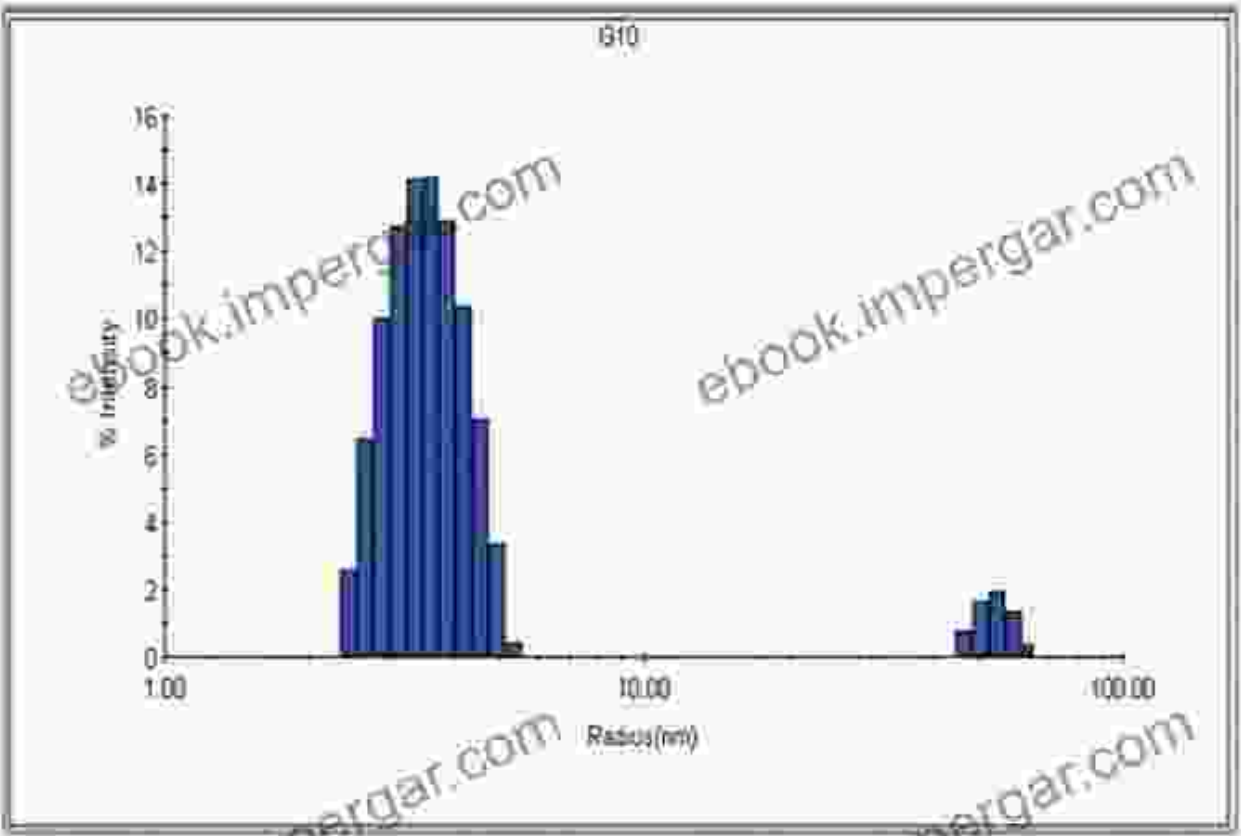
Chapter 6: Advanced Topics in Dynamic Light Scattering

Chapter 6 ventures into advanced topics in DLS. It covers depolarized DLS, which provides information about particle shape and orientation. The chapter also discusses electrophoretic light scattering, which enables the characterization of particle zeta potential. Additionally, it explores the use of DLS in microfluidics and single-molecule studies.

" to Dynamic Light Scattering by Macromolecules" is an indispensable resource for researchers and students in polymer science, protein science, nanotechnology, colloid chemistry, and physical chemistry. Its comprehensive coverage, clear explanations, and practical examples make it an authoritative guide to this powerful analytical technique. With this book, readers will gain a deep understanding of DLS principles, instrumentation, and applications, enabling them to unravel the secrets of matter and push the boundaries of scientific inquiry.

Alt Attributes





(a)

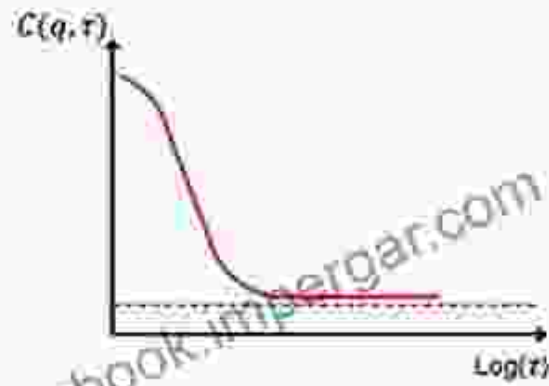
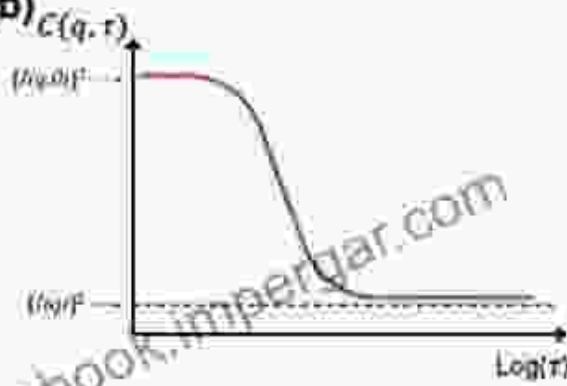
Large Particles



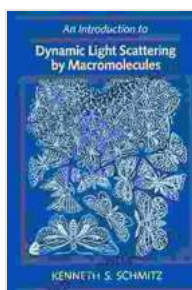
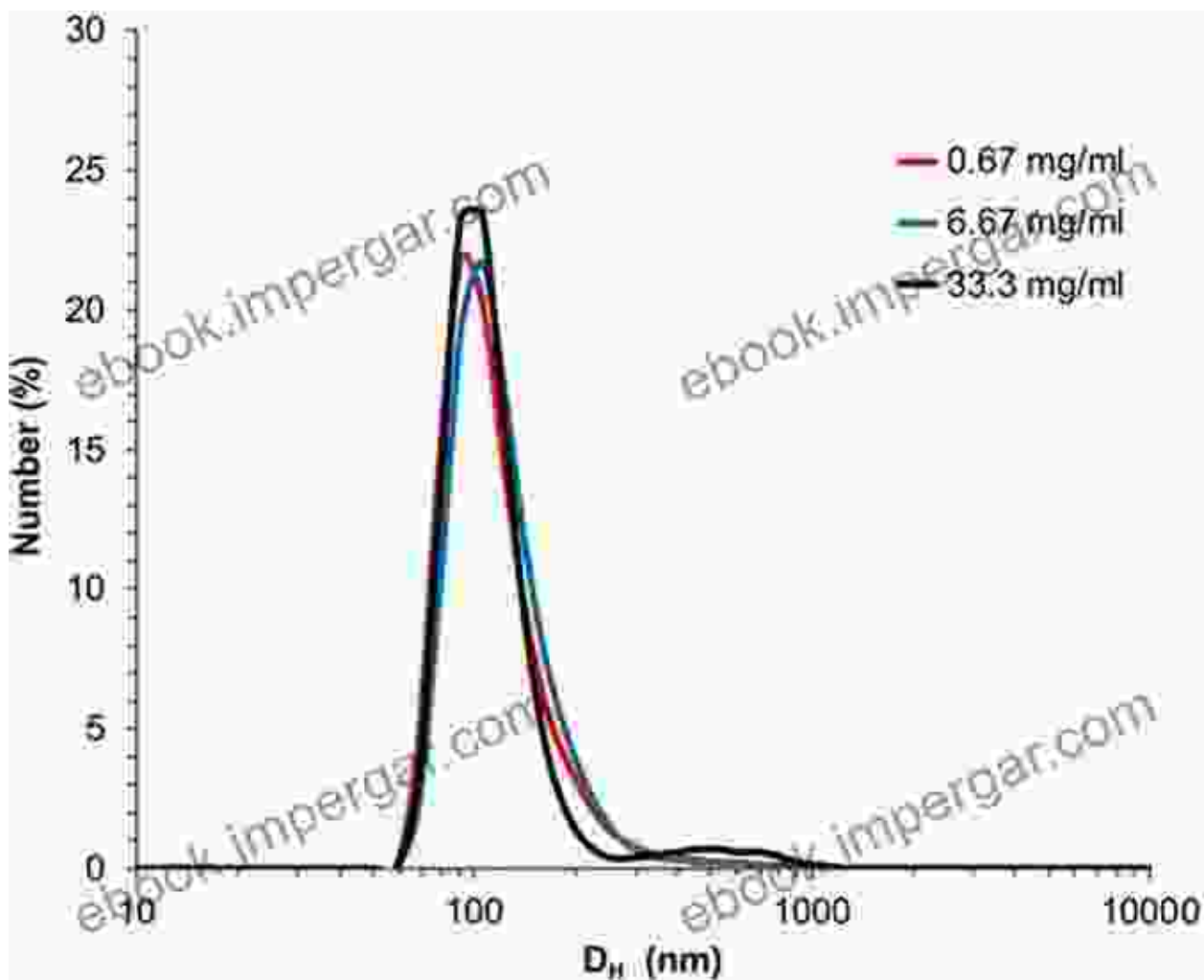
Small Particles



(b)



side illustration of intensity measurement and the associated autocorrelation function to describe the



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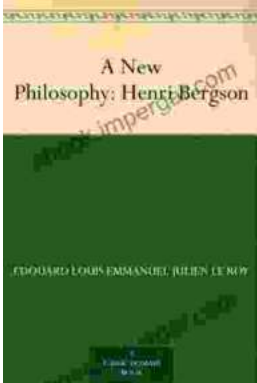
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