

<<表面和胶体化学手册>>

图书基本信息

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### 内容概要

The application area of surface and colloid science has increased dramatically during the past decades. For example , the major industrial areas have been soaps and detergents , emulsion technology , colloidal dispersions ( suspensions; nanoparticles ) , wetting and contact angle , paper , cement , oil recovery , pollution control , fogs , foams ( thin liquid films ) , food industry , biomembranes , membranes , and pharmaceutical industry. Recently , new areas of applications are developing , one of which is the synthetic transplants and biological monitors. These trends show the importance of this field of science in everyday life.

## 作者简介

Dr. K.S. Birdi received a B.Sc. degree in Chemistry from Delhi University, Delhi, India, in 1952. He then traveled to the U.S. for further studies, majoring in chemistry at the University of California at Berkeley. After graduation in 1957, he joined Standard Oil of California, Richmond. Dr. Birdi married and moved to Copenhagen in 1959, where he joined Lever Bros., in 1959 as Chief-Chemist, Development Laboratory. During this period he became interested in surface chemistry and joined, as assistant professor, the Institute of Physical Chemistry (founder of institute: Professor J. Brønsted), Danish Technical University, Lyngby, Denmark, in 1966. He initially did research on surface science aspects (e.g. detergents; micelle formation; adsorption; biophysics). During the early exploration and discovery stages of oil and gas in the North Sea, he got involved in Research Science Foundation programs, with other Research Institutes around Copenhagen, in the oil recovery phenomena and surface science. Later, research grants on the same subject were awarded from the European Common Market projects. These projects also involved extensive visits to other universities and an exchange of guests from all over the world. Dr. Birdi was appointed Research Professor in 1985 (Nordic Science Foundation), and was then appointed, in 1990, to the School of Pharmacy, Copenhagen, as professor in Physical Chemistry. There was continuous involvement with various industrial contract research programs through-out these years. These projects have actually been a very important source of information in keeping up with real problems, and helped in the guidance of research at all levels. Professor Birdi is a consultant to various national and international industries. He is a member of various chemical societies, and a member organizing committees, of national and international meetings related to surface science. He is a member of selection committees for assistant professor and professor, and was an advisory member (1985-1987) of the ACS journal: Langmuir. Professor Birdi has been an advisor for some 90 advanced student projects and various Ph.D. projects. He is the author of some 100 papers and articles (and a few hundred citations). In order to describe these research observations and data he realized that it was essential to write books on the subject. His first book on surface science was published in 1984: Adsorption and the Gibbs Surface Excess, Chatteraj, D.K. and Birdi, K.S., Plenum Press, New York. Further publications include Lipid and Biopolymer Monolayers at Liquid Interfaces, K.S. Birdi, Plenum Press, New York, 1989; and Fractals, in Chemistry, Geochemistry and Biophysics, K.S. Birdi, Plenum Press, New York, 1994. Surface chemistry has remained his major interest of research throughout these years.

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书籍目录

Chapter 1 Surface and Colloid Chemistry  
Chapter 2 Interfacial Interactions of Liquids  
Chapter 3 Surface Tension and Interfacial Tension of Liquids  
Chapter 4 Thermodynamic Properties of Surfactant Solutions  
Chapter 5 Micellar Systems and Microemulsions: Solubilization Aspects  
Chapter 6 Foams and Antifoams: A Thin Film Approach  
Chapter 7 Dielectric Spectroscopic Characterization of Emulsions  
Chapter 8 Solubilization in Aqueous Surfactant Systems  
Chapter 9 Surface Tension of Polymers  
Chapter 10 Cohesion Energy Parameters Applied to Surface Phenomena  
Chapter 11 Chemical Physics of Colloid Systems and Interfaces  
Chapter 12 Colloidal Assemblies Used as Microreactors  
Chapter 13 Scattering and Absorption of Light by Particles and Aggregates  
Chapter 14 Colloid Systems and Interfaces - Stability of Dispersions Through Polymer  
Chapter 15 Particle Engineering of Drug-Loaded Nanoparticles and Their Potential  
Chapter 16 Membrane Mimetic Systems as Compartments for Advanced Materials  
Chapter 17 Surface Properties of Lipids and Proteins at Bio-Interfaces  
Chapter 18 Application of Surface-Active Agents in Petroleum Production  
Chapter 19 Application of Scanning Tunneling Microscopy ( STM ) and Atomic Force Microscopy ( AFM ) in Colloid and Surface Chemistry  
Index

## 章节摘录

A major drawback of the conventional DLS experiment is that the dispersion must be transparent for the light beam. For micrometer-sized particles, this requires concentrations below 10<sup>-3</sup> vol%. Often the concentration of the samples is higher and their dilution for investigation is not desirable. The autocorrelation function of multiply scattered light is difficult to interpret and to extract subsequent information about the particle size. Several modifications have been proposed during the last few years aimed at overcoming this problem and extending the application of DLS to more concentrated suspensions. One possibility is to use a very thin sample cell of an optical path length below 100  $\mu\text{m}$  in order to reduce the multiple scattering as much as possible. Alternatively, Phillips<sup>680</sup> suggested using a more complicated optical system comprising two laser beams and two detectors located at  $\pm 90^\circ$ . The cross-correlation of the signals from the two detectors was measured. The corresponding theoretical analysis was presented by Dhont and de Kruif.<sup>681</sup> Another two-detector optical system was proposed by Drewel et al.<sup>682</sup> which allowed measurements at scattering angles between  $20^\circ$  and  $120^\circ$ . Due to the complex equipment and alignment procedures, these optical systems so far have found limited application.

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