Fundamentals of Interface and Colloid Science: Volume IV: Particulate Colloids and Volume V: Soft Colloids

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A few years ago J. Lyklema started to publish the series Fundamentals of Interface and Colloid Science (FICS) and the idea was and still is to provide detailed and comprehensive text books on this important area of science, which in standard textbooks of physics and chemistry is often paid little attention to.

Now volumes IV and V appeared named "Particulate Colloids" and "Soft Colloids", respectively. They cover systems that many rheologists have to work with and the rheological properties of which are very important for the success of a product in the market. The books will therefore be a valuable source of information for many scientists and engineers who have to deal with colloidal systems. In contrast to the previous volumes, several authors, all are well know experts in their fields, contributed to volumes IV and V. Nevertheless they succeeded in presenting a homogeneous text and as usual in this series the nomenclature is always as clear as possible. All chapters provide general references as well as references to the recent literature.

Volume IV "Particulate Colloids" starts with a short introduction by Lyklema, then Philipse presents aspects of preparation and characterization of colloids with special emphasis on inorganic systems. Pair interactions are discussed in chapter 3 by Lyklema. The DLVO theory is covered in great detail and in contrast to textbooks of physics he mentions explicitly the importance of chemical interactions that are neglected when only the valency of ions is considered. Chapter 4 "Dynamics and Kinetics" by Minor and van Leuven covers particle diffusion, coagulation kinetics and electrodynamics. Vrij and Tunier report on the structure of concentrated colloidal dispersions. This chapter includes attractive and soft interactions and discusses stability and phase separation in colloidal mixtures a topic of great relevance in many applications of complex fluids. The book closes with a chapter on rheology by van Vliet and Lyklema where the basics of rheological experiments and of flow properties of colloidal suspensions and polymer solutions are presented.

Volume V: Soft Colloids starts with a Chapter by Fleer, Cohen Stuart and Leermakers on "Effect of polymers on the interaction between colloidal particles" including an introduction to self-consistent field theory, adsorption, depletion interaction, polymer brushes and aspects of non-equilibrium. The second chapter by Cohen Stuart, de Vries and Lyklema concerns polyelectrolytes and discusses dilute and semi dilute solutions of charged macromolecules as well as complexation and coacervation. The following chapter continues the discussion of macromolecular systems and deals with adsorption of globular proteins on solid surfaces and fluid interfaces. Chapters 4 to 8 cover surfactant based systems. The first is titled "Association colloids and their equilibrium modelling" and provides a theoretical description of surfactant aggregation. Then Strey and Sottmann report on microemulsions covering phase diagrams, experimental techniques for structure determination and discussing ultra-low interfacial tensions. Afterwards thin liquid films are introduced by Platikanov and Exerowa before Bergeron and Walstra report on foams. The last chapter, also by Walstra, discusses emulsions.

The five volumes "Fundamentals of Interface and Colloid Science" will be a valuable text book for students but provide also an excellent reference for researchers that are new to this complex field of colloid and interface science. Especially these two volumes will be of great value and can strongly be recommended for rheologists who work in the field of colloidal systems

Bibliography:
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