

**Surfactants and polymers in aqueous solution**, by Bo Jörnsson and B. Lindman, K. Holmberg and B. Kronberg, John Wiley & Sons Ltd, Chichester, New York, Weinheim, Milton, Singapore, Ontario, 1998: 438 pages, 294 figures, 68 tables, 95 references, hardcover, £. 100. ISBN 0-471-97422-6.

This book originates from courses on the same topic given by the first two authors from the Chemical Centre, Lund University, Sweden, whilst the two following authors come from the Institute of Surface Chemistry in Stockholm, Sweden. The course material grew into extended summaries of lectures, developed further into a compendium and finally became this book.

Surfactants (abbreviation for surface active agents), which literally means active at a surface, are characterized by the tendency to adsorb at surfaces and interfaces. Five kinds of interfaces exist: solid/vapour, liquid/vapour, solid/liquid, solid/solid and liquid/liquid. The driving force for the surfactant to adsorb at an interface is the lowering of the free energy of the face boundary. The term interfacial tension is often used instead of free energy per unit area. This book is concerned with surfactants in solution, i.e. the discussion is restricted to interfaces involving a liquid phase.

In formulated products several types of interfaces are present at the same time. Water-based paints and paper coating colours are examples of familiar but, from a colloidal point of view, very complicated systems containing both solid/liquid (dispersed pigment particles) and liquid/liquid (latex or other binder droplets) interfaces. In addition foam formation is a common (but unwanted) phenomenon at the application stage.

The introductory chapter describes the behaviour of surfactants at interfaces and in solution, their amphiphilic character, their basic raw materials, classification, their ecological impact, and development trends. In chapter II the association of surfactants is dealt with, i.e. the formation of micelles at the critical micelle concentration and general comments on amphiphile self-assembly. Chapter III describes the phase behaviour of concentrated surfactant systems. The physicochemical properties of surfactants and polymers containing oxyethylene groups are presented in chapter IV. Mixed micelles are described in chapter V and intermolecular interaction (pair potentials) in chapter VI. Electric double-layer-forces are important for colloid stability (chapter VII). Chapter VIII is concerned with Polymers in solution". Regular solution theories are dealt with in chapter IX. Surface active polymers

are presented in chapter X and surface active systems in chapter XI. The special topics Surface tension and absorption at the air-water interface" follow in chapter XII. Chapter XIII explains how the adsorption of surfactants at solid surfaces depends on both the nature of the surfactant and the surface. In chapter XIV the interaction of polymers with surfaces is discussed. As is shown in chapter XV there are transient foams and stable foams in surfactant solutions. Polymerizable foams are presented in chapter XVI and in chapter XVII the use of surfactants as emulsifiers is discussed. Microemulsions are described in chapter XVIII and their use especially for oil recovery and soil removal is discussed in chapter XIX. How microemulsions can be regarded as minireactors for chemical reactions is described in chapter XX. The appendix provides a list of surfactant tradenames and a book index.

This book is practical rather than theoretical in scope. It is written as a reference book for scientists and engineers. It is also intended as a text book for courses for employees in industry and for undergraduate courses at universities for which purpose it has already been used at the University of Lund.

H. Domininghaus, Dreieich, Germany