

**Silicone Surfactants**

R. M. Hill (ed)

Marcel Dekker, New York, 1999  
viii + 360 pages. \$150 (hardback)  
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This book is Volume 86 in the well-established *Surfactant Science Series* and it gives a timely description of a broad and growing area of surfactant science. It comprises 12 chapters, written mainly by authors from industry, who provide useful insights into the many applications of surfactant materials.

The first chapter, written by the Editor, gives a general overview of the whole area, while Chapters 2 and 3 cover the important areas of surfactant synthesis, composition and structure. Chapter 4 describes the aggregation behaviour and surface activity of silicone surfactants; these are the important properties on which their many uses described later in the book are based. A large part of the book, Chapters 5–10, deals with the wide range of applications to which the silicone surfactants are currently put. These include the formation of polyurethane foam, foam control and demulsification, the personal care industry, emulsification, agrochemical adjuvants and surface modification. The final two chapters describe newer areas of research. The first of these concerns surfactant-enhanced spreading, which is a concern in areas such as cosmetics, coatings and agrochemicals where the wetting of solid surfaces is of great importance. The last chapter looks at the ternary-phase behaviour of siloxane surfactants, silicone oils and water, concentrating on trisiloxane surfactants, low-molecular-weight oils and water.

It might have been expected that, with a predominance of industrial authors, there would be a concentration on the many industrial formulations available for application. This is, however, not the case, the underlying thread throughout being one of basic science and understanding so that the reader will be able to take away an appreciation of why the surfactants are useful and in what applications they might be put to future use. The reader searching for a specific formulation tailored to a particular problem will have to look elsewhere.

The book is well produced and uses the same typeface throughout the text to give a uniform appearance. This cannot be said for the many equations, structures etc., which have a varied appearance, some of the structures in Chapter 3 being rather unattractive. Overall, the book offers a good review of the current state of silicone surfactants and will be use to all in the field.

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**Trace Elemental Analysis of Metals**

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Stop and read the title again—yes, it does mean the analysis of *metals* for trace constituents. But first we have to be reminded why trace components of alloys are so important, and then to be let into the secrets of so many of the alloys—combining why they are useful with notes on how they may be persuaded to dissolve prior to chemical analysis. I enjoyed these earlier chapters on sampling, and sample dissolution, very much. Then follow the chapters on individual instrumental techniques, each with many detailed procedures on how to determine ‘this’ in ‘that’. The compilation of methods which have stood the test of time is valuable, but I am less convinced that we need to go into the theory of electronic selection rules for absorption spectrophotometry (or into similar details in other chapters). I do not think that the discussion on different spectrophotometers (since it refers to commercial models, it will date very quickly) is particularly helpful, as we are not given hints on how to make the choice ourselves. I miss a note on the performance that we can expect from such instruments these days (very much better than it used to be, even for medium-priced instruments). But, back again on procedures, the author is safe on home ground and guides us between the old and the new with a confident hand.

The introduction to the chapter on AAS runs smoothly through a little history before covering the options available in addition to the use of flames, with a few examples of applications to the analysis of metals. The atomic emission spectroscopy chapter covers a range of ‘samples as sources’: sparks, glow discharges, hollow-cathode lamps, as well as the DCP and ICP for solution samples. There is plenty of interesting detail, but very little on a comparison to suggest which might be the best option for the reader’s own laboratory. Mass spectrometry gets a good share of attention, to both traditional solid-sampling methods and more recent ICP MS. The author is worried that, as instruments become ever more complex, the users are obliged simply to trust them and not to understand or question what is going on. That is a possibility which we must resist. But his second worry, that reference standards for direct-reading spectrographs will simply disappear, does not seem well founded; if anything, the market for certified reference materials world wide is expanding as the demands of QA/QC systems have to be met.

Any small regret I have about this book concerns the scarcity of diagrams. In a science which is so experimental, ‘seeing how it works’ is still important, and I miss the drawings of components in this volume. Nevertheless, we owe a debt to the author for having found time to gather this treasure trove of fascinating and useful information, and to pass it on to us. Only a person