**Silicone Surfactants**
R. M. Hill (ed)
Marcel Dekker, New York, 1999
viii + 360 pages. $150 (hardback)
ISBN 0-8247-0010-4

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.

PAUL D. LICKISS
*Imperial College of Science, Technology and Medicine, London*

**Trace Elemental Analysis of Metals**
Thomas R. Dulski
Marcel Dekker, New York, 1999
592 Pages. $195
ISBN 0-8247-1985-9

Stop and read the title again—yes, it does mean the analysis of *metals* for trace constitutents. 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

with years of experience 'in the business' can do this, and we—the readers and the continuing practitioners—can benefit greatly as a result.

IAIN MARR
*University of Aberdeen, UK*

## Imaging of Surfaces and Interfaces

J. L. Lipkowski and P. N. Ross (eds)
John Wiley & Sons New York, 1999
x + 342 pages. £93.95
ISBN 0-471-24672-7

This book represents a further volume in a series of books on *Frontiers of Electrochemistry*. It describes various aspects of crystal growth, the formation of organic adlayers and films and the imaging of electrochemical adlayers. The title itself is somewhat misleading as it implies that the book describes imaging at all surfaces and interfaces, when in fact it almost exclusively describes theory and experimental investigations of electrochemical surfaces and interfaces.

The order in which the chapters are arranged sometimes seems rather odd; for example, Chapters 1 and 3 would seem to go well together as they describe crystal growth and electrodeposition in the high- (Chapter 3) and low- (Chapter 1) resolution regimes. Both use scanning tunnelling microscopy (STM) and atomic force microscopy (AFM) to investigate crystal growth processes at electrode surfaces. Both chapters are well illustrated and Chapter 3 contains some beautiful colour plates.

The word 'imaging' in the book title suggests that mainly scanning probe investigations of electrode surfaces will be described, and for the most part this is true. Chapter 2, however, provides an excellent description of electron diffraction techniques which can be used to investigate the surface structure of electrodes. Although these are *ex situ* UHV techniques, the authors show that there is still a place for such investigations in a thorough study of an electrochemical surface.

Chapter 4 describes the imaging of reaction fronts at surfaces and interfaces. It is well written, and contains some fine pictures of spiral reaction fronts. Part of the content of this chapter, however, seems rather out of place. For example, around a half of the description of experimental results is devoted to imaging reaction fronts on single-crystal surfaces, particularly the CO oxidation reaction on Pt surfaces (although this is very interesting). Chapters 5 and 6 seem to overlap a little, but this is generally inevitable in a book of this type. Both talk about the formation, ordering and imaging of organic adlayers and thin films on electrode surfaces.

The final chapter of the book describes some of the theoretical aspects of performing STM experiments in an electrochemical environment. In particular it looks at tunnelling processes that can occur in an electrochemical medium in comparison with those in vacuum, and focuses on how the solvent, especially water, facilitates electron tunnelling. It is a very well-written chapter and, despite being theoretical, is easily accessible to any reader. My only criticism is that I felt the chapter should have been placed earlier in the book.

My main criticisms of the book as a whole are that there are many typographical errors (especially in Chapter 1) and some Figures are not labelled with enough information. Some figures are also incorrectly labelled. In addition, the use of acronyms throughout the book is not consistent; for example, Chapter 6 refers to atomic force microscopy (AFM) as scanning force microscopy (SFM). In summary, I found this book very informative and easily accessible to the nonspecialist in this field.

W. A. BROWN
*University College London*

## Metals and the Skin: Topical Effects and Systemic Absorption

R. H. Guy, J. J. Hostýnek, R. S. Hinz and C. R. Lorence
Marcel Dekker, New York, 1999
431 pages. $185
ISBN 0-8247-9385-4

In a society that is becoming ever more industrialized it is becoming increasingly important to understand the effect of the multitude of compounds to which it is possible to be exposed, either in the workplace or from the surrounding environment. This book is therefore a timely overview of the interactions of metals and metal-based compounds with the skin, specifically detailing quantitative analysis of permeability and transport in a comparable form. It is a valuable source of references to published investigations in this area which the authors have considered particularly relevant to human health and safety. Where possible they have presented estimated values of a permeability coefficient for the metal under discussion, selected as a parameter for comparison of percutaneous flux. In addition, data identified as useful for the estimation of skin absorption have been presented for the purposes of risk assessments.

Metals and metal compounds hold a unique place in their interactions with man. The role of some metals as essential elements has long since been recognized, as indeed have the therapeutic benefits of many metals and metal compounds, an area that continues to be exploited and researched today. Conversely, with the ever-advancing understanding of toxicology, the hazards associated with exposure to certain metals are becoming more apparent. The discovery of the immunogenic nature of mercury 100 years ago and more recent recognition of the hypersensitivity of some individuals to certain metals