an amplification factor of 10^4 it is hardly conceivable that one could measure currents in the picoampere range. Perhaps this device was intended to cooperate in a way not explained here with the current follower of the attached potentiostat. This problem is a general one, most authors prefer to treat any instrumentation as a black box. It is fair to say that in most cases the average researcher will not have the necessary background in electronics to apply detailed information appropriately.

Scanning probe techniques (Chapter 16) and spectroelectrochemistry (Chapter 17) are certainly the areas where there have been the most breathtaking advances as compared with the first edition of this book. It is entirely reasonable to limit the treatment to scanning tunneling microscopy (STM), atomic force microscopy (AFM), and scanning electrochemical microscopy (SECM), with impressive samples of actual results in the former chapter. Spectroelectrochemistry is somewhat harder to organize. Except for some electron spectroscopies (Auger electron spectroscopy, etc.), the authors limit themselves to in situ methods. Methods that are mentioned very often, such as UV/Vis and vibrational spectroscopy, or methods where the authors have been involved themselves (electron spin resonance spectroscopy), are described in detail with a wealth of practical information. Other methods such as surface plasmon resonance, ellipsometry, and second harmonic generation are also covered adequately. Somewhat surprisingly, the quartz microbalance shows up, whereas Mössbauer spectroscopy and circular dichroism are missing. This is certainly not a major drawback—spectroelectrochemistry is an extremely broad field that is difficult to cover in an appropriate way. The selection provided here is adequate, and according to publishers' lore a book devoted entirely to spectroelectrochemistry and surface analytical methods will be published soon by Springer. One missing detail—photoemission, in particular from metal electrodes—is briefly mentioned in the final chapter (18) on photoelectrochemistry. This chapter provides a mixture of an introduction to semiconductor electrochemistry and photoeffects at semiconductor/electrolyte solution interfaces. Experimental aspects are also treated, but because the experimental setups are either very complex or extremely simple, not much detail is given.

The illustrations are numerous, carefully designed, and of high quality. Somewhat confusing is the inconsistent labeling of the axes in current–potential plots. Certainly the tradition of polarography merits some attention, but there is certainly no need to apply polarographic thinking to the current–potential curve of the system $Pt/HBr + H_2O/AgBr/Ag$, whereas otherwise CVs are plotted in the way that is generally accepted. Quantity calculus has not been used in the labeling of axes; this should not have happened in a textbook which will sometimes need to provide very detailed guidance for students.

The treatment of mathematical methods and digital simulations in the appendix is limited to a few examples and only one remaining FORTRAN program. References to standard software are provided in an appropriate way. The list of electrochemical data at the end is helpful, although the wrong value of the potential of a Hg/HgO reference electrode on the back page has not been corrected.

All the chapters are as carefully organized as the whole book. Clearly the authors had as a concept in mind to provide at least some guidance for the average reader, without being too patronizing. An extensive list of symbols and abbreviations and a long index provide further assistance. Problems are given at the end of every chapter. This is standard fare in American textbooks, but is rarely encountered in European textbooks. The use of problems is subject to different opinions; without proper answers and/or solutions provided elsewhere, their practical value is somewhat limited anyway.

In conclusion: assuming the reviewer may spend a few pounds on a new book for the electrochemistry laboratory, he will do so by buying the amazingly rejuvenated Bard and Faulkner volume.

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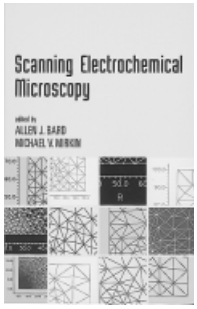
Scanning Electrochemical Microscopy. Edited by *Allen J. Bard* and *Michael V. Mirkin*. Marcel Dekker, Inc., New York 2001. 650 pp., hardcover $ 195.00.—ISBN 0-8247-0471-1

When, about ten years ago, Allen J. Bard and Daniel Mandler proposed the idea of scanning electrochemical microscopy (SECM), no one could envisage the wide variety of problems to which this technique is now being applied. As well as being a further addition to the range of scanning probe techniques for the imaging or modification of surfaces, extending these into the domain of electrochemistry, the method has been shown to have a much wider potential. It has opened up previously unimaginable possibilities for the microscopic study of biological systems and of the kinetics of electrochemical reactions at solid–liquid and liquid–liquid interfaces. This monograph edited by Allen J. Bard and Michael V. Mirkin is the first comprehensive survey of these developments that have occurred during the last decade, and goes far beyond the scope of the few review articles that have appeared.



The book begins with an introduction by Bard in his usual clear style, explaining the basic principle of SECM in a way that the general reader can understand. This is followed by detailed chapters on the construction of the microscope (D. O. Wipf) and the preparation of the microelectrodes (F. F. Fan and C. Demaille), with much practical advice for the experimentalist. F. F. Fan then gives a broad survey of the imaging capabilities as applied to many different systems, and M. V. Mirkin explains the theoretical fundamentals of the imaging mechanism in greater depth. This part of the book covering the foundations of the subject is rounded off by chapters on the application of SECM to measurements on the kinetics of homogeneous and heterogeneous reactions by K. Borgwarth, J. Heinze, and P. R. Unwin.

Applications to liquid–liquid interfaces are then discussed by M. V. Mirkin,

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M. Tsionsky, J. V. Macpherson, and P. R. Unwin. Next G. Denault, G. Nagy, and K. Tóth describe the principles, preparation, and uses of potentiometric probes. Other very impressive chapters are provided by B. R. Horrocks, G. Wittstock, B. D. Bath, H. S. White, and E. R. Scott, who describe applications of SECM to the imaging of biological systems and to studies of transport processes in membranes. D. Mandler describes the use of SECM to create microstructures on surfaces. The book ends with a further chapter by A. J. Bard, in which he discusses many ideas for further developments of this very versatile technique. Each chapter begins with an introduction to the topic that is understandable by nonspecialists, and therefore those who are not familiar with all the details of the method will nevertheless benefit from reading the book. Through their careful choice of authors and clear arrangement of the different topics, Bard and Mirkin have succeeded in producing the first standard work on this rapidly developing technique. Although some of the figures are badly reproduced, that does not detract significantly from the good overall impression.

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Fluorine Chemistry at the Millennium. Edited by *R. Eric Banks.* Elsevier Science, Amsterdam 2000. 656 pp., hardcover $ 259.00.—ISBN 0-08-043405-3

This highly interesting, fascinating, and entertaining book is a monograph of a historical kind, which comprises personalized accounts of the progress and events in both organic and inorganic fluorine chemistry which have happened over the last 50 years. Superbly edited by Eric Banks, *Fluorine Chemistry at the Millenium* is a unique book in which a group of excellent fluorine chemists describe many of the most fascinating and exciting areas of fluorine chemistry in 32 chapters (plus appendices) covering both academic interest and technological aspects. The editor, Emeritus Professor Ronald Eric Banks, himself a prominent fluorine chemist at UMIST, Manchester, began his career in pure academic research, and has since become the world leader in electrophilic fluorination (associated with the product Selectfluor, made and distributed by Air Products). Amongst many other distinctions, he is on the editorial board of the *Journal of Fluorine Chemistry.*

Since all essential areas, ranging from biological aspects to hard-core organic and inorganic noble gas fluorides and metal fluorides are covered (e.g., by N. Bartlett and R. J. Lagow), the book is a must for all dedicated fluorine chemists. With many chapters containing information relating to modern organic, inorganic, organometallic, and industrial fluorine chemistry, with a wealth of literature references, this book is also of great value to anyone interested in historical aspects of this field.

The list of contents is clear and precise, and the name index, subject index, and establishment index help to make this book not only an essential historical monograph, but also a useful and valuable work of reference. Some of the topics covered in *Fluorine Chemistry at the Millenium* are more geographically oriented, such as "Fluorine Chemistry in Russia and Ukraine" (M. J. Atherton), at Novosibirsk (G. M. Brooke), at Durham (R. D. Chambers), in Poland (W. Dmowski), in Italy (G. P. Gambaretto), at Leicester (J. H. Holloway and E. Hope), in Japan (Y. Kobayashi, T. Taguchi, and T. Abe), at Göttingen (H. W. Roesky), at Salford (H. Suschitzky and B. J. Wakefield), at Birmingham (J. C. Tatlow), at Glasgow (J. M. Winfield), and in Slovenia (B. Zemva). There are more thematic chapters, such as those on fluoropolymers (K. C. Eapen), fluorocarbons (D. M. Lemal), and highly toxic fluorine compounds (C. M. Timperley), others on industrial aspects such as "Nuclear Fuel at BNFL" (M. J. Atherton), "Adventures of a Fluorine Chemist at duPont" (W. J. Middelton), and "The ICI Legacy" (R. L. Powell), and snappily titled ones such as "Fluorine Chemistry—A Chemical Gardener's Paradise" (D. D. DesMarteau), "Never Say No to a Challenge" (K. O. Christe), and—last but not least—the editor's contribution on "Going with the Fluo".

One can only congratulate the editor, whose idea of encouraging the authors to combine as much information as possible about the area and themselves with a light, yet authoritative, style has worked out in such a beautiful way. Naturally, the chapters differ in style, depth, and emphasis, but this is exactly what the editor intended: "personalized accounts … written almost without exception by fluorine chemists I [i.e., Eric Banks] have interacted with during my research lifetime". This may also explain why the names of a few of the most prominent fluorine chemists are missing: G. Schrobilgen, K. Seppelt, J. Shreeve … to mention just three of them. The fact that the centennial issue of the *Journal of Fluorine Chemistry* (Vol. 100) already had six chapters of the book included, is hardly relevant, since very few libraries subscribe to this very useful, but expensive, journal.

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Electrochimie physique et analytique. Edited by *Hubert H. Girault.* Presses polytechniques et universitaires romandes, Lausanne 2001. 464 pp., softcover € 59.70.—ISBN 2-88074-429-6

Electrochemistry has proven since its earliest days that its concepts and methods are essential in many other important scientific fields. Recent developments have reinforced this evidence, in particular in biology, environmental sciences, molecular chemistry, etc. However, most of these developments, even when applied by non-electrochemists (as is increasingly often the case), are all rooted in specific electrochemical concepts and considerations that are very often known only to electrochemists. Although many other important physical methods are taught in great detail to nonspecialists, for historical and cultural reasons electrochemistry is generally taught only to electrochemists. This specialization of the teaching means that even physical electrochemistry is often dissociated from analytical electrochemistry.

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