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Book review

Comprehensive Chemical Kinetics, Vol. 29, New Techniques for the Study of Electrodes and Their Reactions, edited by R.G. Compton and A. Hamnett, Elsevier, Amsterdam, 1989, 504 pp., Dfl. 495.00/US$260.50. ISBN 0-444-42999-9.

This volume deals specifically with techniques for directly addressing species at the electrode. These techniques include infrared, Raman, ESR, electroreflectance and photocurrent spectroscopy and ellipsometry. Christensen and Hamnett deal with infrared techniques including attenuated total reflectance, external reflectance, Fourier transform and polarization–modulation techniques. This is followed by Hester who deals with Raman techniques, including surface enhanced Raman and surface enhanced resonance Raman spectroscopies.

Waller and Compton's discussion of in situ ESR methods includes considerable practical detail. Peter deals with photocurrent spectroscopy, a technique which utilizes the photocurrent generated when an electrode is exposed to light of a specific wavelength. This method is of especial value in probing surface films. Greef discusses the use of ellipsometry in the characterisation of surface films.

Hamnett and colleagues discuss electroreflectance at semiconductor electrodes. Monochromatic light is reflected from a semiconductor surface whose reflectivity depends upon the dielectric constant, which is itself dependent upon the electric field. The electroreflectance is then a direct probe of the potential distribution at the electrode. This chapter is especially welcome since this technique is rarely used but can provide significant information if the results are properly analysed.

In addition there is a chapter dealing with ex situ ultrahigh vacuum techniques (Parsons), and one dealing with the construction, use and theory of microelectrodes (Robinson).

The volume also contains two articles dealing with hydrodynamic methods, one by Albery and colleagues dealing with some new techniques, and a very extensive article by Unwin and Compton which deals with channel electrodes and interfacial reaction mechanisms. The book closes with a timely discussion of on-line accumulation and computer processing of electrochemical data (Harrison).

This volume is an extremely useful addition to the electrochemical literature. It is highly practical, providing detailed experimental aspects of the various techniques discussed, but also includes a substantial theoretical

component. There is some variation in the depth of theory provided, from rather superficial to very substantial. However, the editors are to be congratulated for providing a book which should be on the shelves of anyone interested in probing events directly at the electrode surface.

The Editor's Desk