



Electrochemistry: Principles, Methods, and Applications (Oxford Science Publications)

By Christopher M. A. Brett, Ana Maria Oliveira Brett

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This much-needed, comprehensive text offers an introduction to electrochemistry. The book begins at an elementary level and progresses through to the most recent advances in this interdisciplinary subject. The first part introduces the fundamental principles of thermodynamics, kinetics, and mass transport associated with electrode reactions. The second part considers experimental methods that are available to study electrode and electrochemical processes, such as steady-state with forced convection, linear sweep, step/pulse voltammetric techniques and impedance, modern surface analysis, and microscopic and spectroscopic procedures that complement the electrochemical information. The final part of the book discusses wide-ranging applications, including sensors, industrial electrolysis and batteries, corrosion studies, and the rapidly expanding field of bioelectrochemistry. Easily accessible appendices provide the necessary mathematics, principles of electrical circuits, and basics of digital simulation. The breadth of coverage insures that this volume will be valuable not only to students in chemistry, biochemistry, industrial chemistry, chemical engineering, and materials science, but to researchers needing proper introduction to electrochemistry.

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- Sales Rank: #1524620 in Books
- Published on: 1993-07-22
- Original language: English
- Number of items: 1
- Dimensions: 6.13" h x 1.06" w x 9.19" l, 1.55 pounds
- Binding: Paperback
- 464 pages

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Editorial Review

Review

' Its coverage is very wide and the principles section is one of the strongest parts of the book. This book is a good contribution which contains useful information of the principles, techniques and applications of electrochemistry within a single text. It should prove useful to postgraduate and other practitioners in the field.'

Frank C. Walsh, Chemistry and Industry, October 1993

'the Oxford University pedigree of the book is clear ... References are provided at the end of each chapter in the form of key texts, reviews and other papers to kindle the enthusiasm of the reader in the more recent advances in electrochemistry.'

A. Clatworthy, Chemistry in Britain, January 1994

'The discussion on reversible and irreversible reactions is ... by far the most authoritative I have read. It is, however, the "methods" portion of this excellent book that was found to be most impressive. The Bretts have done a great service by providing an excellent introduction to the literature on these topics. Overall, *Electrochemistry: Principles, Methods and Applications* is a cogently written, well-illustrated introduction to modern electrochemistry that can be enthusiastically recommended to both the teacher and the advanced student of electrochemistry.'

Times Higher Education Supplement

'With its emphasis on modern techniques of electrochemistry, the Bretts' book is certainly well suited to meet the wide-ranging needs of readers wishing to apply such methods in chemistry, physics, bioscience, and materials science. Despite the mathematical complexity of the theoretical concepts, the presentation is clear and understandable, enabling both beginners and interdisciplinary scientists to quickly build up a knowledge of methods relevant to their needs. They will be greatly helped in this by the practical advice about electrode materials, cell construction, and instrumentation.'

Jurgen Heinze, Institut fur Physikalische Chemie der Universitat Freiburg, Angewandte Chemie, 1994 33/19

'well produced ... and is not too inhibiting for the novice to gain an insight into this vast area of scientific endeavour ... it is good value for money, and I would recommend it for both personal and library use.'

Analyst, May 1994, Vol. 119

'The book is clearly written and provides a succinct digest of information on modern electrochemistry. The integration of the text and figures is exceptional ... learning and clarity abound in this book and is hence of excellent value.'

T Prem Kumar, Bulletin of Electrochemistry, Vol. 12, No. 7-8, 1996 India

'a comprehensive bibliography is provided to enable the reader to study topics in greater depth ... well suited to meet the wide-ranging needs of readers wishing to apply such methods in chemistry, physics, bioscience, and materials science ... the presentation is clear and understandable ... sound and reliable ... For all those readers who wish to learn about the methods of electrochemistry and how to apply them, the book by Brett and Brett will prove a reliable guide.'

About the Author

Ana Maria Oliveira Brett is at Universidade de Coimbra.

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