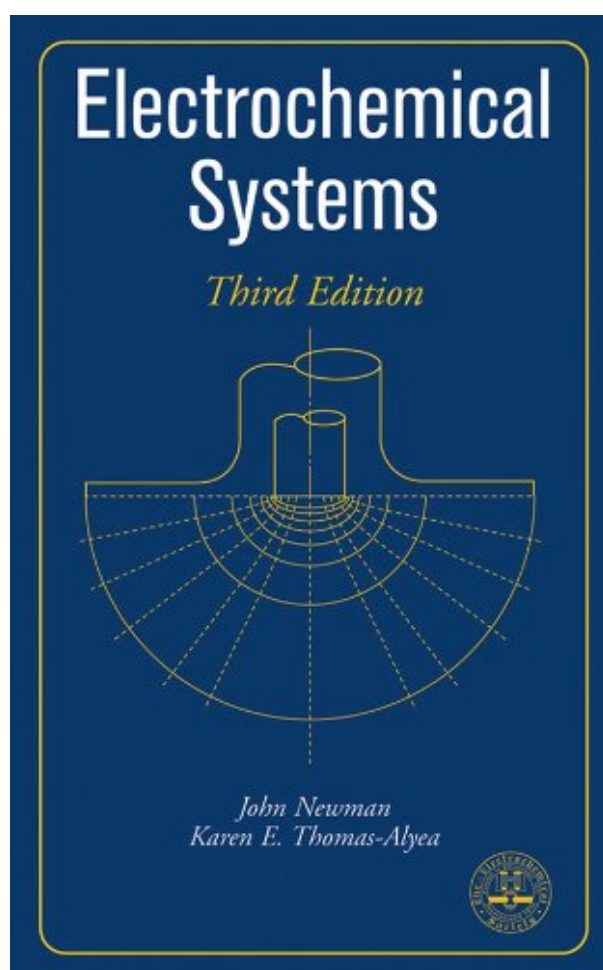


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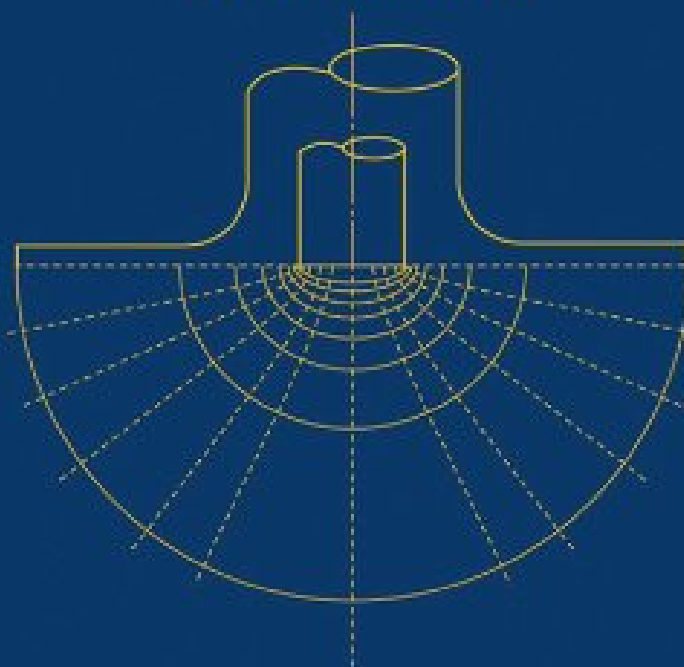


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Electrochemical Systems

Third Edition



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Review

"...a solid, well-rounded discussion of the principal aspects of electrochemistry and is well suited for use as a graduate-level textbook. Also, it will make a valuable personal library addition for the corrosion professional..." (Corrosion, December 2005)

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Theoretical treatment of electrochemistry for advanced courses and Professional Reference.

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The new edition of the cornerstone text on electrochemistry

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The recognized standard of the field, Electrochemical Systems thoroughly covers a wide range of systems and topics in electrochemical engineering. Newly updated and expanded, the Third Edition of this cornerstone text features:

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- Homework problems ranging from the reinforcing to the highly thought-provoking
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electrochemist

Suitable for serious study and application, the material presented spans all the major areas of electrochemistry, from the basics of thermodynamics and electrode kinetics to transport phenomena in electrolytes, metals, and semiconductors. Revisions and additions in this Third Edition cover important new treatments, ideas, and technologies while also increasing the book's accessibility for readers in related fields. *Electrochemical Systems, Third Edition* offers researchers, developers, and advanced students an essential update of this benchmark reference.

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Most helpful customer reviews

11 of 13 people found the following review helpful.
an excellent graduate level book on electrochemistry
By Xiao Hu

This is the BEST book on electrochemistry especially if you are interested in modeling. While it provides the most accurate description on the subject, it is hard to read. This has already been pointed out by other reviewers. But if you are doing modeling, you have to have the accurate understanding of the subject rather than just a good idea that other books could provide.

This book is hard to read because it is precise and because one needs quite a lot of background before appreciating its content. As pointed out by the book itself, the subject is an interplay of heat/mass transfer, fluid dynamics, kinetics, and thermodynamics. For me, the most difficult part is the thermodynamics and the book has the best and most accurate description on electrochemical potential, which is a thermodynamic concept. If you are not already comfortable with chemical potential, activity, and fugacity, you will find it hard to appreciate some the arguments made by Newman. This applies to other aspects but I myself have adequate background on those and do not struggle as much.

For books of this level, do not expect to understand everything the first time. I have read some chapters quite a few times. And I got new understanding each time I read it.

I wish the book could provide answers to some of the problems at the end of each chapter. For self-learners like myself, it is important to practice some problems to enhance the understanding.

6 of 7 people found the following review helpful.
Excellent and cannot give up
By K. Xue

My background is electrical engineering and one day I had to study Newman's book for battery modeling. It

seems hard to read at first glance. Nevertheless, for me this is due to a lack of background in thermodynamics, physical chemistry, as well as electrochemistry. After studying various books on thermodynamics, P. W. Atkins' physical chemistry (only the relevant contents) as well as the electrochemistry book by Carl H. Hamann, Andrew Hamnett and Wolf Vielstich (I recommend that book for self study on electrochemistry), I became much more comfortable of Newman's ideas and interpretation. In Chapters 11, 12 and 13, Newman let the readers do some of the detailed mathematical derivation steps (he did not give the detailed math since this book should be regarded as a standard classic in the field, rather than lecture notes), and I spent a lot of time in carrying out the procedure. No pains, no gains. I even believe that the self-derivation is a good homework in order to strengthen the students' mathematical ability in modeling. Then I turned to love this book and the more I read it, the more I love it. I love the clear concepts and most of my questions are answered by Newman just at the correct moment. It is good for theoretical modeling in the field of electrochemistry and hardly can one find a comparable book in the clarity and completeness of theoretical concepts in electrochemistry (Bard's book is more experimental-oriented). Newman's thought is deep and the application of his work has led to many successful progress in battery modeling, as can be seen from various theoretical papers on J. Electrochem. Soc. using his theory. I thank Prof. Newman for doing this excellent work for us.

4 of 4 people found the following review helpful.

Electrochemical Methods

By Craig A. Milroy

This is the most accessible electrochemical engineering text that I have seen and is a great companion for Bard's Electrochemical Methods textbook. The material is presented in a very understandable fashion.

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