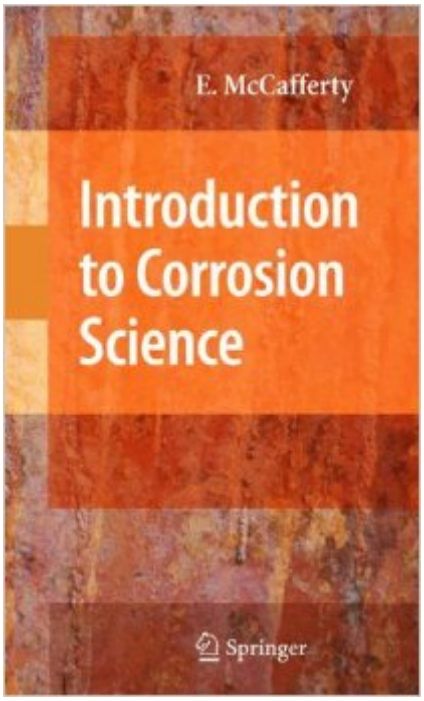
Introduction To Corrosion Science



Synopsis

This textbook is intended for a one-semester course in corrosion science at the graduate or advanced undergraduate level. The approach is that of a physical chemist or materials scientist, and the text is geared toward students of chemistry, materials science, and engineering. This textbook should also be useful to practicing corrosion engineers or materials engineers who wish to enhance their understanding of the fundamental principles of corrosion science. It is assumed that the student or reader does not have a background in electrochemistry. However, the student or reader should have taken at least an undergraduate course in materials science or physical chemistry. More material is presented in the textbook than can be covered in a one-semester course, so the book is intended for both the classroom and as a source book for further use. This book grew out of classroom lectures which the author presented between 1982 and the present while a professorial lecturer at George Washington University, Washington, DC, where he organized and taught a graduate course on â œEnvironmental Effects on Materials.â • Additional material has been provided by over 30 years of experience in corrosion research, largely at the Naval Research Laboratory, Washington, DC and also at the Bethlehem Steel Company, Bethlehem, PA and as a Robert A. Welch Postdoctoral Fellow at the University of Texas. The text emphasizes basic principles of corrosion science which underpin extensions to practice.

Book Information

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Customer Reviews

I’ve bought this book for a one semester undergraduate corrosion engineering course. I must say

that I’m absolutely thrilled with this book! The author has a concise and enjoyable writing style which allows for hours of continuous reading.The book covers quite well the most fundamental topics in corrosion science. I was particularly happy with the author’s coverage of polarization - a topic whose importance can’t be stressed enough, and which can be quite tricky for first-timers. The Wagner-Traud models are presented satisfactorily and the Tafel extrapolation is well explained. Pourbaix diagrams must be pointed out as one of the strengths of this book, since the author essentially builds one of them from scratch - applying Nernst’s equation and equillibrium constants - in a very ditatic fashion.The books also covers important topics such as pitting, crevice corrosion (with mechanisms), coatings and inhibitors. The author also describes many corrosion science techniques, among which is AC impedance, which has been very well covered.While this book is definitely suited as an introductory textbook, I would not recommend it as a thorough reference book for professionals. Even though this might be seen as a flaw, I’ve still decided to give it a 5 stars.Recommended.

I also used this book for a Corrosion Engineering course. I initially purchased it as a supplementary text after finding the required text (Jones) difficult to understand and error-prone. It has the most comprehensive description of electric double-layer theory I’ve seen in any text so far. It covers thermodynamics thoroughly and has an entire chapter on Pourbaix diagrams. It appropriately makes use of chemical activity in place of concentration as in some other texts. It uses the calorie instead of Joules (possible drawback?). It has nice example problems throughout the chapters and end of chapter problems with selected answers in the back. The chapter on kinetics has proved very useful to me for both theoretical and experimental aspects in that it explains mixed potential theory well and contains tables with corrosion rate data obtained from various studies. The images and diagrams are all nicely laid out. The sections within the chapters are not numbered which forces me to page around a bit to remind myself where I am in the chapter. Since purchasing this book I’ve browsed through about three or four other corrosion texts and still like this one the best.

just what I looked for in my scientific literature research. simple, without to much mathematical theory, useful for all who start with corrosion science

Useful for my corrosion class. The practice problems are a good review for tests and cover the important parts of each chapter.

This book does a really good job of introducing corrosion science and how it is studied.

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