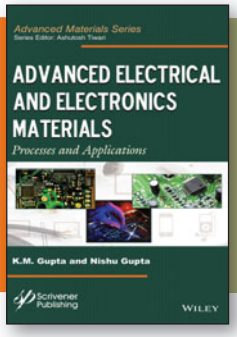


Advanced Electrical and Electronics Materials: Processes and Applications

K.M. Gupta and Nishu Gupta

Wiley-Scrivener, 2015
760 pages, $175.00 (e-book $140.99)
ISBN 978-1-118-99835-9

This book provides brief introductory overviews of electrical and electronic materials, with an intended audience of upper undergraduate and graduate students. It could serve either as a textbook or reference handbook. It is divided into 19 chapters, each with an average of 15 sections, and many more subsections. Many of the subsections are two pages or less, thus none of the topics are covered in depth. Consequently, some of the explanations can be incomplete and confusing. Much of the text is in the form of outlines, lists, and tables identifying the main characteristics of several materials, their functional dependencies (such as changes with temperature), and their virtues for specific applications.

The book includes many example problems and end of the chapter problems that could be assigned as homework in an introductory materials science course. These problems are divided among basic definitions, concepts, and short, simple numerical calculations such as calculating the wavelength produced by a semiconductor with a given energy bandgap.

There are figures on almost every page illustrating basic concepts. Most of the figures are of good quality and illustrate a significant concept, but some are dated (e.g., a desktop computer from circa 1995), some are not particularly informative (a photograph of the exterior of 11 DVD and television remote controls), and some are of poor quality.

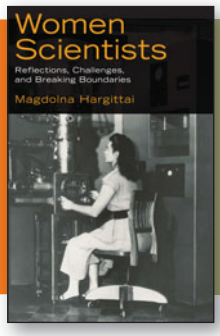
The authors frequently use vague, qualitative terms that are not defined in describing properties. For example, a favorable property of semiconductors is "they are much smaller in size." Presumably the authors are describing semiconductor devices, not the semiconductors themselves, but what they are being compared to is not clear. No context is given. As another example, the virtue of palladium as a contact metal, is that "it is cheap." The division between cheap and expensive is not defined. Perhaps it is less expensive than gold or platinum, but it is much more expensive than some of the other contact metals listed such as tungsten, molybdenum, and silver.

In other cases, the text is oddly specific. The coefficient of resistance for semiconductors is given as -4×10^{-6}/°C to 6×10^{-6}/°C without any clarification whether this is strictly for silicon or all semiconductors. There is some repetition as well (e.g., the Fermi–Dirac probability function is introduced in two places in the text, just three pages apart).

The section on Semiconductors is not up to date, as it focuses almost exclusively on silicon and gallium arsenide. Furthermore, the properties are presented without any context explaining that one type of material might be better or more favored than another. Specifically, in the past 20 years, silicon carbide and gallium nitride have become the dominant semiconductors for displays, lighting, and power devices, while progress on zinc selenide has waned.

In summary, even though this is a new book, several older textbooks cover the same topics more completely and provide better, more easily understood explanations of physics and chemistry. A good example is *Principles of Electronic Materials and Devices*, 2nd ed., by S.O. Kasap (McGraw-Hill, 2002).

***Reviewer: J. H. Edgar** of the Department of Chemical Engineering, Kansas State University, USA.*



Women Scientists: Reflections, Challenges, and Breaking Boundaries

Magdolna Hargittai

Oxford University Press, 2015
384 pages, $29.95
ISBN 978-0-19-935998-1

The term "women in science" has long been associated with nonconformist women who use their unique and special qualities to surmount the mountains of science and then retain their footing in the largely male-dominated fields. But who are these women, and how do they actually see their careers? This question is asked and mostly answered in this book by Magdolna Hargittai, research professor of structural chemistry at the Budapest University of Technology and Economics. The book captures 60 of her approximately 100 interviews with female scientists who hold or have held high positions in science and administration, but also includes some with more ordinary scientific careers. Hargittai has been dedicated to interviewing both male and female scientists for years, and this book is the compilation of her research and visits with women in the United States and Europe, plus Russia, Turkey, and India—countries whose women of science she felt are underrepresented.

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