Altogether the DECHEMA Corrosion Handbook is a very valuable reference book for all engineers working in the area of corrosion, provided that the reader has a thorough knowledge of this area and is thus able to critically evaluate the information in the figures, tables and text of individual chapters. The organization of the Handbook is clear, and it is rather easy for the user to find the desired information. In addition to this, the large number of literature references cited in the Handbook (about 400 for most chapters, citations up to 1980) offers even more information to users who have to solve special corrosion problems.

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Miscellanea

Photophysics of Polymers. Edited by *Charles E. Hoyle* and *John M. Torkelson*. American Chemical Society, Washington, D.C., USA 1987. 531 pp., $ 119.95.—ISBN 0-8412-1439-5

This clearly structured and nicely presented book stems from a symposium of the Division of Polymer Chemistry of the American Chemical Society which took place in Anaheim, CA, in September 1986. The book is designed to provide scientists engaged in basic and applied polymer research with a comprehensible text on polymer photophysics. The philosophy of the book is that photophysical phenomena allow one to gain an accurate picture of the properties of polymers, both in solution and in solid phases. Based on the historical development as well as on current practice, the book is divided into six main sections: 1) Overviews, 2) Polymer Dynamics and Complexation, 3) Excimer Photophysics, 4) Energy Migration, 5) Luminescent Polymerization Probes, 6) Photophysics of Silicon-Based Polymers.

On the whole, the book is a timely and most welcome addition to the literature in a field which has recently seen a strong increase of interest. In fact several works on related subjects have been published over the last few years: the monographs by *J. Guillet:* "Polymer Photophysics and Photochemistry; an Introduction to the Study of Photoprocesses in Macromolecules" (Cambridge Univ. Press, 1985) and *J. F. Rabek:* "Mechanisms of Photophysical Processes and Photochemical Reactions in Polymers; Theory and Applications" (Wiley, New York 1987) as well as the multi-author volumes: "Polymer Photophysics, Luminescence, Energy Migration and Molecular Motion in Synthetic Polymers" (edited by *D. Phillips*, Chapman and Hall, London 1985), "Photophysical and Photochemical Tools in Polymer Science: Conformation, Dynamics, Morphology" (edited by *M. A. Winnik*, NATO ASI-Series C, Vol. 182, D. Reidel, Dordrecht, Netherlands 1986) and "New Trends in the Photochemistry of Polymers" (edited by *N. S. Allen* and *J. F. Rabek*, Elsevier, London 1986). In my opinion the new book edited by *Hoyle* and *Torkelson* is extremely valuable, since it stands at the forefront of this dynamic field which offers many possibilities for future developments. The presentation is—unusually for a multi-author book!—balanced; most of the active research groups in the field are well represented. Of course, one cannot expect a book with some eighty contributors to present a unified viewpoint; however, one gets a good snapshot of the situation. Furthermore, even the camera-ready printing does not impair the presentation too much.

The individual contributions stress the application of photophysical methods to polymers, and it is indeed gratifying for a physicist to see such devoted use of physical methods in chemistry research. While most groups have realized the importance of time-resolved measurements (the contributions by the groups of *M. D. Fayer, H. F. Kauffmann* and *S. E. Webber* highlight this trend), an intimate connection between theory and experiment is—in general—still lacking. Several contributors have, in my opinion, not always been cautious in interpreting their data, and one sometimes gets the feeling that the method is over emphasized; in many cases I would welcome a comparison of photophysical results with data obtained by other physicochemical methods.

In summary, the editors have achieved their goal of providing a picture of the state-of-the-art situation in the photophysics of polymers. I view the book as a valuable addition to the library of scientists actively involved in polymer research.

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Physics at Surfaces. By *A. Zangwill*. Cambridge University Press, Cambridge 1988. xiii, 454 pp., hardcover £ 40.00.—ISBN 0-521-32147-6

Physics at Surfaces is an excellent introductory book for students or other researchers interested in surface processes. It is certainly the best source of general information about the concepts and techniques of surface physics/chemistry, painting a broad-brush picture of the current state of the field and covering a broad range of topics. Characteristics of both metal and semiconductor surfaces, clean and adsorbate-covered are described. Topics such as the thermodynamics and electronic structure of surfaces, and adsorption/desorption phenomena are discussed. Several emerging, albeit not understood areas, such as metal organic chemical vapor deposition (MOCVD) and energy transfer at or near surfaces are also introduced.

There is rather comprehensive coverage of the myriad of techniques used in surface science so that the reader is exposed to the spectroscopic methods currently available and their typical applications. Necessarily, the discussion of the large number of topics is somewhat superficial. A student who would actually use one or more methods would most certainly need to read more broadly. While the bibliography serves as a good starting point for more in-depth reading, it is not comprehensive because of the large number of topics discussed in the book. Only selected examples are referenced on a given topic, e.g. the study of activated adsorption using molecular beam techniques. Therefore, if the reader or instructor of a course wishes to go beyond the text, an independent review of the literature will be necessary in many cases.

The text is also a useful overview of the developments in the field of surface chemistry for experienced researchers in surface physics and related fields. Results of experiments performed over the past two decades are synthesized into a general framework. The overview serves as a conceptual basis for the vast research encompassed in the area of surface physics and induces one to cast current work within this framework.

Overall, *Physics at Surfaces* is an excellent introduction to the emerging and developing field of surface science from which both students and experienced researchers will benefit.

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Metallic Superlattices—Artificially Structured Materials. Edited by *T. Shinjo* and *T. Takada*. Elsevier, Amsterdam 1987. xii, 271 pp., bound, DFl 240.00.—ISBN 0-444-42863-1

Advances in ultrahigh-vacuum deposition techniques have made possible the sequential monolayer-by-monolayer deposition of artificially layered materials including semiconductors, metals, etc. This volume 49 of the series "Studies in Physics and Theoretical Chemistry" is a collection of review papers on artificially layered metal structures presented by several principal investigators. The majority of the authors (five out of eight) are university professors in Japan, so that the book has a somewhat eastern asian flavor, although the research activities in this field are equally spread all over the industrialized world. However, with the recent rapid growth of activity on artificially layered materials and the concomitant dramatic increase in the number of published papers, finding a book that can serve as a comprehensible text for an introductory course is particularly important. This book addresses that purpose very well, and it is to be highly recommended for that use, as well as to the individual reader seeking an introduction to one of the special topics discussed in five of the chapters.

The book consists of seven chapters: 1. Overview of metallic superlattices (*T. Shinjo*), 2. X-ray diffraction studies on metallic superlattices (*Y. Fujii*), 3. Neutron diffraction studies on metallic superlattices (*Y. Endoh*, *C. F. Majkrzak*), 4. Mössbauer spectroscopic studies on superlattices (*T. Shinjo*), 5. NMR studies on superlattices (*H. Yasuoka*), 6. Superconductivity in superlattices (*V. Matijasevic*, *M. R. Beasley*), 7. Theories on metallic superlattices (*K. Terakura*). Much credit must be given to the editors for providing an extensive list of element combinations used in layered metallic structures and a comprehensive bibliography in the appendix.

In the areas covered this fine book is close to being a state-of-the art summary of current research.

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High-Resolution Solid-State NMR of Silicates and Zeolites. By *G. Engelhardt* and *D. Michel*. John Wiley & Sons, Chichester 1987. xiv, 485 pp., hardcover £ 55.00.—ISBN 0-471-91597-1

For many years solid-state NMR spectroscopy was regarded merely as a tool for specialists in the shadow of the more important magnetic resonance applications to the liquid state. This changed after novel sophisticated high-resolution techniques such as magic angle spinning (MAS) and multi-pulse experiments were developed for solid materials. Nowadays multinuclear high-resolution solid-state NMR spectroscopy is attracting increasing interest in chemistry, materials science and many other domains. The new book by *G. Engelhardt* and *D. Michel* gives a survey of one of the most important applications, i.e. that to silicates, aluminosilicates, zeolites and silicate sorbents. It is an excellent introduction to high-resolution solid-state NMR spectroscopy in general, and gives an overview of current research activities in silicate and zeolite science in particular.

The text is organized in seven chapters beginning with a short introduction to the historical background. Chapter 2 treats the basic principles of high-resolution NMR of solids. The nuclear spin interactions affecting the spectral features are described in the irreducible tensor notation, and the most important experimental techniques (MAS, cross-polarization, dipolar decoupling, multi-pulse methods) are briefly discussed. The peculiarity of adsorbed molecules is emphasized. Since detailed information about the structure of species containing silicon has been obtained from studies of the liquid state, the third chapter of the book is completely devoted to ^{29}Si NMR of silicate solutions.

The next two chapters deal with general aspects and applications of ^{29}Si and ^{27}Al NMR studies of silicates, aluminosilicates and zeolites. Experimental methods, general features of the spectra, spectral parameters and correlations with structure are discussed in Chapter 4, whereas Chapter 5 summarizes the large amount of data that have already been accumulated from studies on natural and synthetic silicate and aluminosilicate materials and zeolites. In addition to crystalline materials and especially zeolites, other materials included are glasses, layer silicates, silica polymorphs and tectoaluminosilicates.