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BOOK REVIEW

Clean Surfaces: Their Preparation and Characterization for Interfacial Studies. Edited by George Goldfinger, Dekker, New York, 1970 xix + 385 pp. $18.75.

The compilation is the result of a 3-day symposium in 1968 which had the stated objective of collecting multidiciplinary literature concerning the techniques of preparation and characterization of clean surfaces. Some 352 pages excluding references and acknowledgments are devoted to this general subject. Presumably each paper which was presented at the symposium has been included with the result that the book varies widely in chapter length and content type. Some of the chapters are fairly long reviews of a specific subject, exemplified by chapters such as "The Use of Scanning Electron Microscope in Surface Characterization" (O. Johari), or "The Electronic Surface States of Finite Lattices" (P. Mark). (Authors are indicated in parentheses.)

A second classification or chapter style is a much shorter semi-review which is highly oriented toward the author's own research area and publications. Typical of this type of chapter is "The Nature of Leached Glass Surfaces" (M. L. Hair) which deals primarily with infrared studies; and "Chemisorption Studies on Clean Silver Powder Using the Vacuum Ultramicrobalance" (A. W. Czanderna).

A third division which occupies about 25% of the book is devoted to individual papers which are research reports and are either experimental or theoretical in content. Typical of this type are "Adsorption Properties of Heterogeneous Surfaces" (M. J. Sparnaay), or "Characterization and Preparation of Atomically Clean Surfaces for Investigation in Ultra High Vacuum" (H. E. Farnsworth). The chapter by Sparnaay is an elegant derivation of theoretical isotherms using the Langmuir and Frumkin model. Unfortunately the chapter is short and the nine-page exposé is abbreviated and difficult to follow.

Another slightly longer chapter entitled "The Evaluation and Production of Homotattic Solid Substrates of Certain Alkali Halides" (S. Ross and J. J. Hinchen) describes a technique for the production of finely divided halide salts. Subsequent rare gas adsorption is used to demonstrate, using the Ross-Oliver model, a high degree of uniformity which the surfaces of these materials may possess. Unfortunately this uniformity is not clearly defined and one is uncertain if the Ross-Oliver treatment has been adequately tested.

It is beyond the scope of this evaluation to discuss all of the longer chapters which are primarily reviews. Of these, ellipsometry, which is a technique which does not seem to have made much progress recently, is dispatched in 12 pages and 20 references dating back to 1889. Contrasted with this is 39 pages and 111 references on "Techniques and Criteria in the Purification of Aqueous Surfaces" (K. J. Mysels and A. J. Florence). Here again references date to 1808 and one wonders if including the complete documentation on these very early works truly serves much purpose. However, most of these review chapters are current and generally represent the state of the art.

For one who is truly seeking a comprehensive review volume on surfaces, clean or otherwise, these 18 chapters will fall far short. The extreme diversity in content and chapter length is mostly responsible for a feeling of scattered coverage. Adding to the difficulty is a wide variety of symbols and diagrams which are unique to each individual chapter. Separately taken, however, some of the review chapters are well written and can serve as a preliminary or introductory text to some complex areas of surface chemistry. Particular attention can be given to the previously mentioned chapter by P. Mark. This 40-page chapter with 27 references could well serve as an introduction to current thinking in solid state surface theory. This chapter covers both the free electron and the tight binding approximation with modest other treatments on the chemisorption states of ionic lattices an the intrinsic surface state of an ionic lattice.

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