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Book Review

Fundamentals of Gas–Surface Interactions. Edited by H. Saltzburg, J. N. Smith, Jr., and M. Rogers. Academic Press, Inc., New York and London, 1967. 540 pp. Price $14.50.

This book is the proceedings of a symposium held in San Diego in December 1966. Some comments on the symposium itself are therefore in order. The objective as stated by the organizers was "to bring together specialists in the many interrelated areas of gas-surface research." Obviously the desired result of such an effort was to establish communication and cooperation between the different areas of interrelated research represented by those in attendance. Such efforts are laudable and should be encouraged particularly by workers in catalysis and other applied fields of research related to surfaces who have much to gain from a more fundamental understanding of the surfaces themselves.

The symposium was divided into a discussion of three major themes: (1) The Surface and Its Characteristics, (2) Adsorption or Reaction of Gases On or With Surfaces, and (3) Scattering Processes Including Energy and Momentum Transfer. While these subjects certainly include an interesting and challenging spectrum of topics for such an interdisciplinary symposium, many of the "interrelated areas" that might have been included were not, or else were touched on very lightly. With the exception of an invited paper by G. K. Boreskov, no attention was given to catalysis in the papers presented. The problem of surface vaporization received only passing mention in an invited paper by F. P. Bowden. Completely absent was any discussion of the spectroscopic investigation of surfaces and the characterization of surface electrical or magnetic properties. Others may be able to cite additional subjects not adequately covered, yet one can hardly expect even an interdisciplinary meeting to cover all possible ground. The three subject areas treated represent a selection which the editors deemed appropriate and important. Further, it would seem that such a symposium can only be successful if there is enough common ground to enable attendees to bridge the gaps, and it must be concluded that the editors have exercised judgment and care in attempting to strike a balance between the variety of research experiences and the community of interests represented. This is evidenced by the interesting discussion sections accompanying each main theme. One need only scan the names of the contributors to the discussions to realize that conference attendees with research interests in one of the three areas were able and ready to make contributions to the ideas of workers in the other two.

Each of the three topics was introduced by invited speakers. The invited speakers for the second and third themes were largely review papers, but the first theme "The Surface and Its Characteristics" was not introduced by any general review. Rather the invited papers are discussions of specific researches without a careful attempt to orient the reader to the field. The main difference between the invited papers in this section and the contributed ones seems to be the number of researches described per paper. As a result those readers who do not have a close familarity with the field may find it difficult to appreciate how the work presented relates to the current problems and progress in this area of research.

Invited papers in the second section were given by G. P. Halsey, Jr., G. K. Boreskov, and Robert Gomer. Workers in catalysis will find little new information in the Halsey and Boreskov papers, but is is certainly clear that this type of paper was both pertinent and useful within the context of the symposium. On the other hand, the paper by Gomer which presents a rather thorough review of chemisorption on clean metal surfaces by a number of techniques will be both useful and interesting to the catalytic chemist. As a review this paper is probably the most complete of any of the invited papers.

Another contribution of particular interest is the brief description of some work by M. Boudart on the effect of the aggregation of metals on their catalytic activity. This paper was given during the meeting as an invited contribution, but appears only in abbreviated form in the discussion section.

The three invited papers which introduce the third section are on thermal accommodation coefficients, experimental studies of molecular beam scattering phenomena, and the theory of gas–solid collisions. These papers are well written and provide an adequate introduction even to the

uninitiated reader to the most complete and thoroughly covered of the three sections. In this section the editors have clearly made a most meaningful and thorough selection of papers which bring the reader in contact with the forefront of current research. This could have been anticipated, perhaps, since all three of the editors are currently active in the field themselves and it is, after all, somewhat narrower in scope than the other two themes treated. Readers with interests in any area of surface chemistry and physics will find this section worth perusal and depending on their specific interests may find it worth careful study and digestion.

One other point worthy of comment is that this volume appeared in print about nine months after the symposium was held. To do this the papers were photoreproduced directly from the authors' manuscripts. The value of such a volume as this decreases substantially with time and it is clearly worth some loss in uniformity to have such early access to the work in print. One would hope that such procedures might become the rule rather than the exception in reporting conferences and symposia. In fact, if the lag time could be made about three months shorter, substantial benefits would result.

It is hoped that other interdisciplinary meetings like this one will be held in the future. It is possible that an organizing committee with more diverse research interests than those of the editors of this volume might produce a better balance between review and reporting functions, than appears in their first two sections. But this work is certainly a serious and successful attempt to initiate more dialogue among surface physicists and chemists with widely differing approaches to surface science.

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