

## BOOK REVIEWS

**Surface Physics of Materials, Volumes I and II.** By J. M. BLAKELY. Academic Press, New York, 1975. \$47.50.

It is pleasing and useful to have the state of the art in surface physics presented in one place. The two volumes edited by Professor Blakely serve this purpose admirably well. Reviews are written by experts who are actively pursuing research in the field. Each paper can be used as an authoritative reference to acquaint the reader with a subfield of surface physics.

In the first chapter, there is a review of surface crystallography which is one of the most important new fields of surface science. The theory of low-energy electron diffraction has developed to the point that the determination of the surface structure of simple solids and atomic or molecular adsorbates becomes possible. A recent review of this field is most welcome. The next chapter reviews the electronic structure of solid surfaces by one of the main contributors to the field. The *ab initio* calculation of the electronic states at the surface and the experimental verification of these calculations have made this field one of the most rapidly developing in the field of surface science. The third chapter reviews the statistical thermodynamics of clean surfaces while

the fourth chapter presents a thermodynamic treatment of adsorption and surface segregation. The phenomena of electronic and atomic transports are treated in Chapters 5 and 6. Chapter 7 treats the formalism to describe atom and molecule interactions with surfaces. Chapter 8 treats chemical analysis of surfaces while Chapter 9 concentrates on atom vibrations at surfaces. Finally, Chapter 10 discusses the important adhesion and friction properties of surfaces by one of the experts in this large field of surface chemistry.

Each chapter presents a separate and distinguishable subfield of surface science and surface physics. If there is a criticism of the book, it would be the lack of cohesion among the various chapters. There has been no attempt to intermesh the information contained in the various sections.

The two-volume set can be recommended for graduate students interested in surface science. It is also a welcome addition to the library of the working scientist in the various subfields of surface science and a useful reference for teachers in physics and chemistry as well.

G. A. SOMORJAI

*Department of Chemistry  
University of California  
Berkeley, California 94720*

**Organochromium Compounds.** By R. P. A. SNEEDEN. Academic Press, New York, 1975. viii + 327 pp. \$33.00/[T] 16.50.

It is fortunate that the editors of this series of Organometallic Chemistry should include the topic of organochromium compounds in their continuing sequence. The structural elucidation of organochromium compounds played a timely role in the development of organometallic chemistry.

The isolation and characterization of an entire field is not a simple task, yet the author has been able to capture the essence of organochromium chemistry in three well developed but lengthy chapters which cover the literature through 1974.

Chapter 1 on the preparation of organochromium compounds spans the historic structural deciphering of Hein's compounds to the more recent carbenoid chromium complexes discovered by Fischer and his co-workers. This chapter is replete with physical data and descriptive information on organochromium derivatives.

The second chapter, entitled "Characterization and Identification," includes chemical and physical data on the arene complexes, metallocene complexes, and the carbenoid chromium complexes. The chemistry of  $\beta$ -elimination stabilized  $\sigma$ -bonded derivatives is also covered.

The final chapter on the reactions of organochromium compounds is a valiant effort to sum-

marize the important reactions, and place them in perspective with other organometallic compounds. The author has eschewed extensive mechanistic analysis, primarily because most of the mechanistic pathways are not known. Some of the topics discussed are  $\alpha$ -elimination, metallocycle formation and the catalytic importance of organo-

chromium compounds. The book is well written, concise and should be of value to synthetic organic and inorganic chemists.

WILLIAM C. KASKA

*Department of Chemistry  
University of California, Santa Barbara  
Santa Barbara, California 93106*