

BOOK REVIEW

Principles of Surface Chemistry. By G. A. SOMORJAI, Prentice-Hall, Englewood Cliffs, New Jersey, 1972. xviii + 283 pp. \$10.95.

This book brings together many important aspects of the physical chemistry of surfaces. The opening chapter, dealing with the structure of solid surfaces, illustrates several points with examples from low energy electron diffraction (LEED). Chapters 2 and 3 provide a summary of thermodynamics, lattice dynamics, and diffusion at surfaces. As is true throughout the book, derivations are clearly presented with a minimum of mathematical manipulations, and supporting experimental data is often provided. Chapter 4 includes descriptions of both the electronic properties of solid surfaces and experimental techniques such as field electron and field ion microscopy and Auger and photoelectron spectroscopy. The discussion of gas-surface interactions in the final chapter is augmented by an introduction to molecular beam scattering from surfaces and a summary of the structure of chemisorbed gases demonstrated by LEED. While the discussions of LEED develop many interesting points, they do not include mention of the most recent theoretical advances which have rekindled expectations that LEED can provide quantitative as well as qualitative details of surface structure. The problems at the end of each chapter include some which open new areas of interest by requiring reading and discussion of selected references.

Overall, the book provides an excellent intro-

duction to the fundamentals of surface science and will be useful both as a textbook and as an orientation for the increasing numbers of researchers becoming interested in surfaces. Those reading for detail should be cautioned against a few inconsistencies. Though a list of symbols is provided, meanings of symbols are sometimes changed in the text. In Section 3.3, for example, x is used for displacement in the text while u is used in Table 3.1. While most equations and derivations are carefully qualified, those which are not may lead the reader to assign them greater significance than is warranted. Equation 4.83 for calculation of the energy of Auger electrons, for example, is only a rough approximation based on ground-state energy levels. There are also a few proofreading errors, but most of them are clear from the context. Possible exceptions are 1 eV for 1000 eV on the last line of page 181 and inconsistency in the sign of V_s in Section 4.5.

These points are minor flaws in a smoothly written, well organized presentation of the principles of surface chemistry. Especially in view of the author's most recent contributions toward closing the gap between practical catalysis and research on oriented clean surfaces, this book should be of particular interest to the readers of this journal.

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