JOURNAL OF CATALYSIS 79, 248–249 (1983)

BOOK REVIEWS

Chemistry and Physics of Solid Surfaces, Volume III. Edited by R. VANSELOW AND W. ENGLAND. CRC Press, Boca Raton, Fl., 1982. 337 pp., $44.95 ($51.95 outside USA).

Finally, the long awaited Volume III of the review series "Chemistry and Physics of Solid Surfaces" appeared. It should be of interest to those working in catalysis. Not only is the introductory, historical review paper written by Georg-Maria Schwab, it also contains an interesting contribution by G. Ertl. The Table of Contents lists the following reviews:

"Development of Kinetics Aspects in Catalysis Research," Georg-Maria Schwab;

"Reaction Mechanisms in Catalysis by Metals," G. Ertl;

"Surface and Adsorbate Structural Studies by Photoemission in the $h\nu$ = 50- to 500-eV Range," David A. Shirley;

"Diffusion in Surface Layers," Gert Ehrlich;

"Molecular and Atomic Beam Scattering from Surfaces," D. R. Frankl;

"Molecular Beam Epitaxy—Surface and Kinetic Effects," C. T. Foxon;

"The Determination of the Habit Planes of Nanometer-Size Single-Crystal Gold Particles," M. J. Yacaman, K. Heinemann, and H. Poppa;

"Chemisorption of H, Cl, Na, O, and S Atoms on Ni(100) Surfaces: A Theoretical Study Using Ni_{20} Clusters," Thomas H. Upton and William A. Goddard III;

"Structure and Thermodynamic Properties of the Crystal-Melt Interface of a Monoatomic Substance," A. Bonissent and B. Mutaftschiev;

"Plasma Etching—A Discussion of Mechanisms," J. W. Coburn and Harold F. Winters;

"MeV Ion Scattering for Surface Structure Determination," L. C. Feldman;

"Computer Simulation of Microclusters, Surfaces, and Interfaces," Farid F. Abraham;

"SEXAFS: New Horizons in Surface Structure Determinations," P. Eisenberger, P. Citrin, R. Hewitt, and R. Kincaid;

"Diffraction Effects in Angle-Resolved Photoemission Spectroscopy," S. Y. Tong and C. H. Li.

The book contains an extensive subject index with about 2600 entries. Despite the delay, it is another volume of this well-established series worth having on one's bookshelf.

W. KEITH HALL

Department of Chemistry
University of Wisconsin
Milwaukee, Wisconsin 53201

Chemistry and Physics of Solid Surfaces, Volume IV. By R. VANSELOW AND R. HOWE. Springer-Verlag, Berlin/Heidelberg/New York, 1982. 496 pp., $44.00.

Since 1973, every other year twenty-one invited speakers, experts in their area of specialization, have presented tutorial lectures at the International Summer Institute in Surface Science (ISISS), held at the University of Wisconsin–Milwaukee. These reviews have dealt preferentially with gas/solid interface phenomena (however, there have been also lectures on liquid/solid and solid/solid interfaces); catalysis has always received an appropriate amount of attention.

Since 1973, the invited speakers have also written review papers, which were published first under the title "Surface Science: Recent Progress and Perspectives," and after ISISS 1975 under the title "Chemistry and Physics of Solid Surfaces."

The 1981 edition entitled "Chemistry and Physics of Solid Surfaces," Volume IV, is now available from Springer-Verlag. It contains the following contributions:

Development of Photoemission as a Tool for Surface Science: 1900–1980, W. E. Spicer;

Auger Spectroscopy as a Probe of Valence Bonds and Bands, D. E. Ramaker;

SIMS of Reactive Surfaces, W. N. Delgass, L. L. Lauderback, and D. G. Taylor;

Chemisorption Investigated by Ellipsometry, G. A. Bootsma, L. J. Hanekamp, and O. L. J. Gijzeman;

The Implications for Surface Science of Doppler-Shift Laser Fluorescence Spectroscopy, D. M. Gruen, A. R. Krauss, M. J. Pellin, and R. B. Wright;

"Analytical Electron Microscopy in Surface Science," J. A. Venables;

He Diffraction as a Probe of Semiconductor Surface Structures, M. J. Cardillo;

0021-9517/83/010248-02$03.00/0

Studies of Adsorption at Well-Ordered Electrode Surfaces Using Low-Energy Electron Diffraction, P. N. Ross, Jr.;

"Low-Energy Electron Diffraction Studies of Physically Adsorbed Films," S. C. Fain, Jr.;

Monte Carlo Simulations of Chemisorbed Overlayers, L. D. Roelofs;

Critical Phenomena of Chemisorbed Overlayers, T. L. Einstein;

Structural Defects in Surfaces and Overlayers, M. G. Lagally;

Some Theoretical Aspects of Metal Clusters, Surfaces, and Chemisorption, R. P. Messmer;

The Inelastic Scattering of Low-Energy Electrons by Surface Excitations: Basic Mechanisms, D. L. Mills and S. Y. Tong;

Electronic Aspects of Adsorption Rates, O. Gunnarsson and K. Schönhammer;

Thermal Desorption, D. Menzel;

Field Desorption and Photon-Induced Field Desorption, J. H. Block;

Segregation and Ordering at Alloy Surfaces Studied by Low-Energy Ion Scattering, T. M. Buck;

The Effects of Internal Surface Chemistry on Metallurgical Properties, C. L. Briant.

The average number of references per contribution is about 60. The literature reviewed includes those from 1981. The book contains an extensive subject index with about 1200 entries.

"Chemistry and Physics of Solid Surfaces" has proven to be a valuable addition to the surface scientist's library. It keeps the expert up-to-date in the various subareas of a fast-growing discipline. It may also be used as a supplementary text (in addition to the student text books) in advanced surface science courses. With the large number of references and the unusually long subject index, these books have become highly regarded workhorses, and Volume IV is no exception.

W. KEITH HALL

Department of Chemistry
University of Wisconsin
Milwaukee, Wisconsin 53201