It is obvious that a book by so many authors contains much overlapping material. The deadlines, known and feared by each teacher at a summer school, cause some papers to be less careful than usual. Nevertheless, the coverage of the subject, the choice of authors and material and the level of the contributions is very good. Nowhere else can such a wealth of material on electron and magnetization densities be found in a single volume. Each scientist active in the field should have easy access to the book and no student doing research on the subject should continue without reading the appropriate chapters, if not all of it. The publisher has made this possible by bringing out a well printed book at an acceptable price.

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Acta Cryst. (1980). A**36**, 1093

The nature of the surface chemical bond. Edited by T. N. RHODIN and G. ERTL. Pp. xii + 405, Figs. 105, Tables 22. Amsterdam, New York, Oxford: North-Holland Publishing Company, 1979. Price $58·50, Dfl 120.00.

This book deals with various theoretical and experimental aspects of the bond between metal surfaces and chemisorbed species. It contains an *Introduction* and five chapters, written by different authors. Two chapters (about 50 pages each) give theoretical considerations; one of 160 pages reviews the various electron spectroscopic techniques applied to chemisorption; one chapter (36 pages) deals with surface crystallography; the last part (68 pages) considers the energetics of chemisorption.

There are two main streams in the theoretical description of the electronic structure of surface–adsorbate systems: the solid-state physics point of view and the approach from quantum chemistry. T. B. Grimley, in the first chapter, gives a very lucid account of some theoretical techniques of importance within the first tradition, confining himself entirely to molecular orbital schemes, however; R. P. Mesmer in chapter 2 gives a nice overview on the theoretical methods originating from a quantum-chemical way of thinking. The latter author, after having given a comparison of the existing theoretical models, particularly considers the cluster-model theory and its application to some chemisorption systems.

The chapter on electron spectroscopy and surface chemical bonding written by T. N. Rhodin and J. W. Gadzuk reviews the most effective electron spectroscopic techniques as they are applied to obtain factual information on the surface chemical bond: ultraviolet photoelectron spectroscopy, X-ray excited photoelectron spectroscopy, Auger-electron spectroscopy and high-resolution electron energy-loss spectroscopy. The authors give a well-balanced overview on the theoretical and experimental principles of these spectroscopies. This is followed by a discussion of the experimental results obtained for typical gas–metal chemisorption systems, illustrating the specific types of information available.

M. A. Van Hove, in a chapter on surface crystallography and bonding, presents a systematic summary of the surface geometrical information obtained with low-energy electron diffraction.

The last contribution by G. Ertl on the energetics of chemisorption on metals is an account from a (physical) chemist's point of view. This author considers the microscopic features of the energetics of chemisorption. Basic subjects from catalysis such as the ensemble and ligand effect, surface stoichiometry, surface steps, activation barriers, interaction between adsorbed particles are extensively discussed within the context of the main theme.

The book as a whole gives a well integrated and documented account of the current areas of research around the central theme of the surface chemical bond. Although most of the contributions cover the literature until the end of 1977 only, the book may very well be used by graduate students and research scientists as a point of departure for entering the subject and for obtaining a good perspective on this area of intense scientific activity.

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Acta Cryst. (1980). A**36**, 1093–1094

Crystals – growth, properties and applications, Vol. 2. Edited by H. C. FREYHARDT. Pp. 199. Berlin, Heidelberg, New York: Springer-Verlag, 1980. Price DM 88.00, US $52.00.

This volume contains four dissimilar articles connected only by the thread that they are concerned with aspects of crystal growth.

The first article by K. & J. Nassau is a very timely review concerned with *The growth of synthetic and imitation gems.* This is a good introduction to the field which gemologists and those increasingly involved in relating natural minerals to controlled laboratory experiments will find very useful. Many others will find it a review of some fascination since it covers not only the techniques used for crystal growth but also the properties that make a material suitable for gem use. The fundamentals of gems and gemology are also usefully outlined.

The second article is by E. Schönherr and is an extremely practical review entitled *The growth of large crystals from the vapour phase.* Many workers in universities or research institutes commencing work on growing crystals sufficiently large for research study should find this a valuable aid in choosing the techniques and equipment most appropriate to their needs and in interpreting the crystal morphologies which can be produced. The discussion is restricted mainly to crystals which evaporate congruently but the methods described can also be applied to growth by dissociative sublimation and chemical transport.