ments such as the application of Seemann–Bohlin geometry, multichannel diffractometry and automatic control are briefly described. The third chapter starts with brief remarks on qualitative powder analysis and proceeds with a description of the steps involved in performing a quantitative analysis, with many practical instructions included. In Chapter 4, different types and sources of error are enumerated and discussed. The authors seem, however, to underestimate the difficulties and errors caused by the strains and imperfections in crystalline materials. The last chapter provides the reader with examples of the quantitative X-ray powder analyses of some minerals. The bibliography contains references to 235 papers.

The book may be useful as an introduction to quantitative X-ray powder analysis as well as a reference book on the subject.

K. ŁUKASZEWICZ

Institute for Low Temperature and Structure Research
Plac Katedralny 1
50–950 Wrocław
Poland

**BOOK REVIEWS**


This is the second volume of a series containing articles by individuals who have made substantial contributions to various problems of topical interest in surface physics. The objectives are to give a broad coverage but with an emphasis upon fundamentals which will remain sound as the subject develops.

The five chapters in this volume contain reviews of Transport of Matter at Surfaces by H. P. Bonzel, Interaction of Atoms and Molecules with surfaces by J. W. Gadzuk, Chemical Analysis of Surfaces by R. L. Park, Surface Vibrations by M. G. Lagally and Interaction between Surfaces: Adhesion and Friction by D. Tabor. As is usual with collections of articles of this type the reader wishing to learn how actually to perform an analysis will have to make use of his references.

Rather than reviewing the various theories of chemisorption Gadzuk concentrates upon the approach in which theoretically exact solutions are obtained to (oversimplified) model problems. The virtue of this approach is that it can give physical insight into the atomistic and electronic mechanisms of chemisorption. This theory is applied to three specific adsorption experiments: W(100)–H; alkali metal adsorption on metals and 5d transition metals on tungsten. The assumptions made about the reader’s prior knowledge vary enormously and so the extent to which the objectives will be met is difficult to judge.

Bonzel points out that, in spite of an extensive literature, knowledge of the microscopic processes of surface diffusion is still quite limited. He gives emphasis to the results rather than the experimental techniques and includes references to useful recent reviews. He concludes with a well justified criticism of the use of simple pairwise interaction models.

Park gives a rather philosophical review of the principles of various techniques of surface chemical analysis. The reader wishing to learn how actually to perform an analysis will have to make extensive use of his references.

The atomic vibrations at clean crystalline surfaces are described by Lagally who compares theory and the results obtained using LEED and atomic scattering. Very little data is available on surface phonons and their dispersion and that which exists is difficult to interpret. Lagally’s article is a good aid for interpretation.

In an article unusual for this type of book Tabor gives an excellent review of the friction and adhesion between surfaces of ‘real’ materials as opposed to flat, single-crystal planes. It makes salutary reading for any surface physicist who may have claimed that his work on some carefully selected simple system will throw light upon the mechanisms of adhesion.

In all this is a useful book for a state ment of the current position and a useful source of references to original material.

M. PRUTTON

Department of Physics
University of York
York YO1 5DD
England


A review of this book by P. Hartman has been published in the November issue of Acta Crystallographica, Section A, page 1035.