

major role in such diverse fields as catalysis, development of gas sensors, sintering of ceramics, passivation of metals against corrosion and high- T_c superconductivity. Most metals have a wide variety of oxide phases, with differing stoichiometries, oxidation states, electronic properties and crystal structures. No surface is ever perfect, but small amounts of defects may even dominate some properties of a metal oxide surface, since a change in the local geometry and stoichiometry may cause a change in the local electronic structure. Surface preparation is a crucial element for any experiment on surfaces, but it is especially critical for metal oxides.

The above paragraph summarizes the introduction to the new book by Victor E. Henrich and P. A. Cox, *The Surface Science of Metal Oxides*. Both authors are recognized experts on metal oxides: Henrich has worked extensively with metal oxide surfaces, and many examples in the book are drawn from his experience; Cox wrote a book on the bulk properties of transition metal oxides, *Transition Metal Oxides: An Introduction to Their Electronic Structure and Properties* (Clarendon, 1992).

The Surface Science of Metal Oxides deals almost exclusively with the basic properties and behavior of surfaces of well-characterized and mostly single-crystal samples. It gives a detailed and thorough account of the geometric, vibrational and electronic structures of the most common faces of various metal oxides as well as their interaction with adsorbates and overlayers. The authors have made great efforts to systematize their knowledge of the subject. This is particularly beneficial in the long chapter on molecular adsorption, where they categorize by adsorption mechanisms, by adsorption behavior for specific molecules and by adsorption on different oxide surfaces, before discussing specific systems in detail.

Since surface scientists tend to forget what is underneath the fascinating first couple of atomic layers, the authors' excursion into the bulk electronic structure of metal oxides that precedes the discussion of surface electronic structure is both refreshing and enlightening. (Spoiled by this, I would have wished an equally tutorial introduction for the part on the geometric structure.) Another strength of *The Surface Science of Metal Oxides* is the way it deals with the rapidly growing literature in the field. The close-to-1000 references are mostly organized in tables, saving the reader from being swamped in details and facilitating dig-

ging into the original literature if needed. The authors also say what is *not* known about metal oxide surfaces—information that is often almost as valuable as what is known.

The book will be a useful resource for physicists, chemists and materials scientists; some background in surface-science methods is needed to take full advantage of the information given. It certainly has a prominent place on my bookshelf, and I highly recommend it for anyone writ-

ing a paper, thesis or proposal on metal oxide surfaces.

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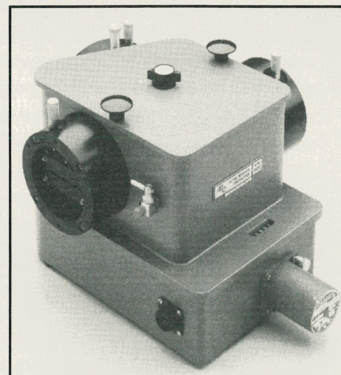
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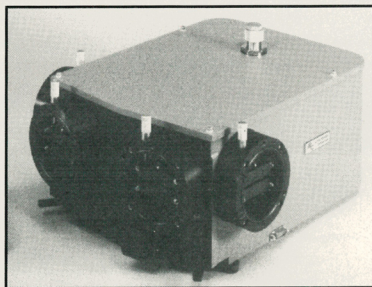
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