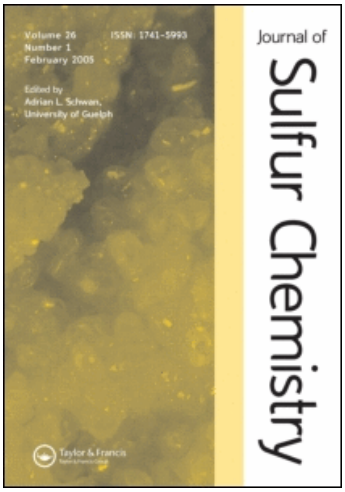

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BOOK REVIEW

Mark R. Albert and John T. Yates, Jr., *The Surface Scientist's Guide to Organometallic Chemistry*, American Chemical Society, Washington, DC, 1987, xiii + 214 pp., $59.95 (in U.S. and Canada $49.95), ISBN 0-8412-1003-9.

The audience for this book is people working or studying in the fields of surface, colloid, organometallic or inorganic chemistry.

After the introduction chapter, chapter 2 (14 pages) introduces briefly basic coordination chemistry in terms of the octet and 18-electron rules, simple valence bond and molecular orbital theory. Chapter 3 which is the strength of this book (112 pages) gives a good survey over the various molecular species commonly used as ligands in coordination chemistry. The ligands discussed are divided into 13 classes and the discussion is intended as a means of categorizing the variety of species that could potentially be studied on surfaces.

Chapter 4 (34 pages) discusses theoretical calculations for the relevant bonding sites in clusters that also appear on surfaces and how they can be applied to gain a better understanding of surface chemisorption. The last chapter in the book (12 pages) is a short presentation of how orbital symmetry and orbital overlap can be applied to surface band structure calculations.

The discussion of the various ligands used in coordination chemistry and their relation to chemisorption in chapter 3 is good and well documented from both an experimental and theoretical point of view. A more pictorial presentation of the different electronic interactions discussed in this chapter would probably have given the reader a more coherent picture of how the different complexes are built up from a molecular orbital point of view.

The presentation of bonding sites in clusters (chapter 4) is mainly based on Roald Hoffmann's (spelled Hoffman throughout the book) work. The binding of ligands to monometal or atop sites and up to multiple binding sites are discussed using the frontier orbital approach. A minor point here is that it is a shame that some of the drawings do not have the same standard as those taken from the literature.

The last chapter (5) is also based on Roald Hoffmann's work —two examples are presented: bonding of CO on Ni(100) and of H_2 on Ni(111). The chapter introduces also the terms density of states and crystal orbital overlap population.

The book gives a good starting point for graduate students and research workers not familiar with the field of organometallic chemistry and its overlap with surface chemistry. The book will hopefully inspire some surface chemistry people to see the connection to organometallic chemistry using frontier orbitals.

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