Principles of Organometallic Chemistry, by P. Powell; Chapman and Hall, 1988, xv + 414 pages, £30.00 (hard cover), £13.95 (paperback), ISBN 0-412-27590-2.

This book is a substantially revised version of Coates, Green, Powell and Wade, "Principles of Organometallic Chemistry" which appeared in 1968. The last twenty years have seen an explosive growth in the subject, with an enormous range of exciting developments. As noted in the preface, however, the capacity of the student's brain is unlikely to have increased commensurately, and this does necessitate a considerable degree of selectivity in the material chosen for inclusion, and a high degree of organisation.

The structure of the first part of the book which deals with organometallic derivatives of the main group elements (140 pages) has changed relatively little since the first edition, but the contents and examples chosen have changed substantially. Attention has been paid to the important applications of this chemistry in organic synthesis and the polymer industry. The account is well organised and students will find it very valuable.

Chapter 5 deals with "Some Transition Metal Chemistry Relevant to Organometallic Chemistry". The main reaction types are discussed and metal carbonyls are considered; students without a sound grounding in group theory will find the section on spectroscopy a little beyond them. Such knowledge is also assumed in Chapter 6 on ligand classification and theories of bonding. Chapters 7 and 8 work their way through complexes of alkyls, alkylidenes, alkenes, alkynes, allyls, and dienes, whilst chapters 9 and 10 deal with complexes of cyclopentadiene and arenes. The section on cluster compounds is divided between a long discussion on boranes, carboranes and metallocarboranes, and a much shorter one on transition metal clusters. The final chapter discusses transition metal catalysed processes, particularly those of industrial importance. A final few pages are used to discuss the complexes of the lanthanides and actinides.

This is clearly a good book for students, which does its job efficiently, at a price which is reasonable. The material is clearly presented, each chapter is provided with suggestions for further reading. There is a set of problems with each chapter, mostly taken from Final Examination papers in various British universities. Instructors will wish to known that they can obtain a set of solutions.

I was, however, left with the impression that this is not a very exciting book. Whilst students feel comfortable with an approach which is in the "preps and props" genre, this may not be as intellectually challenging as their instructor would wish. I would have liked to see much more discussion of reactivity, and more discussion of interrelationships between the groups of complexes, together with some impression being given of a fast expanding and challenging field, with additional importance to organic chemistry, bioinorganic chemistry, and modern materials.

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