

## Preface to the Second Edition

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By mid-1981, with the manuscript for the first edition in the hands of the publishers, we had little inkling that the field of multiple metal–metal bond chemistry would continue to grow at the same explosive rate as it had through much of the 1970s. However, in the intervening 10 years, far more work has been published in the area than in all the period prior to 1981. This spectacular growth of new advances in the field, which continues to this day, along with the favorable response that the first edition received, prompted us to embark on the preparation of a second edition of *Multiple Bonds between Metal Atoms*. The present text is the result.

We have endeavored to include not only those topics that appeared in the first edition, but all significant advances that have been published since. The coverage of the literature in the field is complete up to December 1990, with most of the literature that appeared throughout 1991, during the final stages of manuscript preparation, also being cited. Any omissions of work prior to the end of 1990 are inadvertent. To bring the coverage, at least of the most important topics, as nearly up to date as possible, we have added a short additional chapter (Chapter 11) which includes literature from late 1991 and early 1992.

The dramatic increase in the literature in this field has necessitated some compromise in the depth of coverage of certain topics in order to keep the text size within reasonable bounds. Also, certain topics have grown much more rapidly than others and are therefore afforded more detailed coverage than in the first edition. While there has been some significant reshuffling in the organization, the text is generally along similar lines to those employed previously. Chapters 1–4 cover the same topics as those in the first edition, although Chapter 2 now includes all types of multiply bonded dirhenium and ditechneum compounds, instead of just those that contain quadruple bonds. Triply-bonded dimolybdenum(III) and ditungsten(III) compounds of the type  $L_3MML_3$  constitute such an important and extensive area of chemistry that they are now afforded coverage in a separate chapter (Chapter 5). There has also been such a dramatic growth in the chemistry of multiply bonded dimetal compounds of the platinum metals, and many of their closely allied singly-bonded analogs, that separate chapters are now devoted to the chemistry of diruthenium and diosmium compounds (Chapter 6), singly-bonded dirhodium (II)

compounds (Chapter 7), and compounds of the other platinum metals, especially those of diplatinum(III) (Chapter 8). There are many other classes of multiply bonded compounds that bear an important and, in some cases, close relationship to those of the types  $L_3MML_3$ ,  $L_4MML_4$ , and  $L_5MML_5$  which are the principal focus of this text. These comprise the following: higher nuclearity clusters (trinuclear, tetranuclear, hexanuclear, and octanuclear); various organometallics, such as the mixed cyclopentadienylcarbonyl compounds  $(\eta^5-C_5R_5)_2M_2(CO)_n$  (e.g.,  $(\eta^5-C_5Me_5)_2Mo_2(CO)_4$ ); edge-sharing and face-sharing bioctahedra; simple diatomic molecules. All are discussed together in Chapter 9. Finally, Chapter 10, which contains the most important physical, spectroscopic, and theoretical results that have been obtained on compounds discussed in earlier chapters, follows closely the format of Chapter 8 in the first edition, except for the omission of diatomic molecules now covered in Chapter 9.

As before, we appreciate the invaluable assistance of our many friends and colleagues who have continued to ply us with preprints and other interesting tidbits of information on unpublished results. These insights have helped us greatly throughout the preparation of this manuscript. In this regard, a particular word of thanks is due to our good friend Professor Malcolm H. Chisholm. One of us (R. A. W.) is most grateful to Keng-Yu (Ivan) Shih for his critical reading of several chapters. Once again, we are particularly grateful for the wonderful secretarial assistance of Mrs Rita Biederstedt and Mrs Irene Casimiro who have patiently helped us overcome many obstacles in the preparation of both editions of this text. This edition is dedicated to both of them, with our profound thanks for their help in this and many other of our scientific endeavours.

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