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Book review

Advances in Organometallic Chemistry, Volume 12; edited by F.G.A. Stone and R. West, Academic Press, New York/London, 1974, xi + 457 pages, \$35 (£16.80).

The book under discussion is the twelfth volume of this series which was started 10 years ago and which has become one of the important review series of organometallic chemistry. The choices of topics of the editors in the present volume are, in general, good ones. Continuing their attention to the cultural history of organometallic chemistry by means of personal reminiscences of this field's most eminent and experienced practitioners, they have invited Joseph Chatt to tell about his research career in organometallic chemistry. Chatt's short chapter makes interesting reading, allowing one to follow his so very productive career in industry and university, with accounts of its many successes, but also of some "which got away".

In the second chapter of this book, A. Wojcicki provides the second part of his long review on insertion reactions of transition metal—carbon σ -bonded complexes. Covered are insertions of sulfur dioxide (a field to which he is one of the main contributors) and of other unsaturated molecules. (Carbon monoxide insertions had been discussed in the first part in Volume 41 of this series.) Not only is the insertion of small molecules into the transition metal bond to carbon covered, but also the reverse reaction, the extrusion of such small molecules from transition metal complexes. Of particular interest is Wojcicki's discussion of the kinetics and mechanism of the SO_2 insertion and extrusion reactions.

Organozinc compounds, in the hands of Frankland, their discoverer, and of other chemists of the second half of the 19th century, were the first synthetically useful organometallic reagents. After they were displaced from most of their applications in synthesis by the Grignard reagents, their further course of development went through a period of stagnation. However, the late 1950's saw the discovery of the divalent carbon transfer chemistry of α -haloalkylzinc compounds, and since that time organozinc chemistry has undergone a renaissance. The use of organozinc compounds in synthesis, with emphasis on the divalent carbon transfer chemistry, is reviewed in the third chapter of this book by J. Furukawa and M. Kawabata. The value of this chapter lies principally in its coverage of other aspects of organozinc chemistry, since the divalent carbon transfer chemistry of α -haloalkylzincs has been reviewed more thoroughly by Simmons et al. in Volume 20 of "Organic Reactions" (1973).

B.E. Mann follows with a chapter on ^{13}C NMR chemical shifts and coupling constants of organometallic compounds. This useful review with

many tables will require early updating, now that NMR spectrometers with natural abundance ^{13}C capabilities are finding their way into more and more laboratories.

Although the application of organocopper reagents in synthesis has been reviewed previously, the fifth chapter in this book by A.E. Jukes on the organic chemistry of copper is nevertheless welcome, since it provides broad and quite complete coverage of preparation, constitution and structure, and chemical reactivity of such compounds.

The sixth chapter, by R.S. Dickson and P.J. Fraser, in contrast, is very much narrower in scope and covers the compounds derived from reactions of alkynes and carbonyl complexes of cobalt. Much of the work in this field has already been reviewed by Hübel in Volume 1 of "Organic Syntheses via Metal Carbonyls" (1968); but it is useful to have all the work on cobalt carbonyl-derived compounds updated and collected together in one review. The authors, who have done much research in this area, have done a nice job summarizing what is known of this area which abounds with very novel organometallic structures and some useful reactions.

In the final chapter M.I. Bruce continues his accounts of what's new in the literature of organotransition metal chemistry with a summary covering 1972. A useful feature is the bibliography of reviews which have appeared, but, unfortunately, a large fraction of the reviews thus so tantalizingly listed is either not available to the average mortal or not comprehensible to him in terms of language. The main group organometallic chemists must be jealous of their transition metal colleagues who are thus spoiled by Bruce's literary spoon feeding!

In summary, Volume 12 is a welcome addition to this series and it should find its way to all library shelves. How many individuals will be willing to pay \$35.00 for it is another question.

*Department of Chemistry
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139
(U.S.A.)*

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