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Book reviews

New Applications of Organometallic Reagents in Organic Synthesis; Proceedings of a Symposium at the American Chemical Society National Meeting, New York City, April 6—9th, 1976; edited by D. Seyferth, Elsevier Scientific Publishing Co., Amsterdam, 1976, x + 488 pages, U.S. $ 44.75/Dfl. 116.

This book is the first volume of the new Journal of Organometallic Chemistry Library. It represents a timely attempt to awaken interest in use of organometallic reagents in organic synthesis, bringing them firmly into the armamentarium of synthetic chemists. While this topic has hardly suffered from a dearth of coverage in the form of books and reviews recently, and production of an organic compound is often used to provide an application of and justification for a preparative organometallic reaction, little effort has been expended on the methodology of the process. New, small scale syntheses of simple ketones or alcohols with expensive, difficultly-prepared and -handled organometallic reagents are hardly needed, and practicability has often been forgotten in reported "applications". By a clever choice of authors, the present volume has moved synthetic organometallic chemistry to a new plateau of sophistication, where considerations of chemo-, regio- and stereo-chemistry, selectivity, and functional group protection are paramount to brute-force bond construction. The twelve symposium participants are largely organic-trained chemists with an intuitive, delicate sense of the finer points of synthetic methodology. They are also largely younger practitioners, who have obeyed with zeal the charge of the editor: "to present not only their own research but also pertinent results of others so that a balanced overview would result". Thus these twelve reviews are more complete than an Accounts of Chemical Research type presentation would have been expected to be.

The leading and longest chapter (D. Seebach) on lithium, concentrates on developments since 1973, but in 60 pages of typescript can provide only a cubistic sketch of the material in 557 references, many of which are misnumbered, e.g. eqn. 15 and Scheme 15. It is to be sure a complete coverage of functionalized organolithiums in outline form, arranged from an organo-preparative rather than organometallic viewpoint. The following section (E. -I. Negishi) on organoboron and organoaluminum nucleophiles is briefer, and limited largely to ate-complexes as alkenyl and alkynyl transfer agents, reflecting the author's interests.

Group IV is represented by a well-conceived and well-referenced treatment of silicon in synthesis (P. Hudrlik) which succinctly illustrates the manifold possibilities this metalloid has for facilitating organic transformation, and an equally complete treatment of tin (M. Pereyre) divided into sections on Sn—H, Sn—C, and Sn—X bonds and their applicability. The latter chapter presents with charm and insight many techniques deserving of wider appreciation.

Chapters on copper (J.F. Normant) and mercury (R.C. Larock) complete the use of main group elements in synthesis. The former concentrates on work since 1972 and can be profitably read in conjunction with Posner's Organic

Reactions chapters, while the latter provides a useful overview of a complicated field where the literature is littered with inaccuracies and false trails. The emphasis in both these chapters is on reactions which work.

Transition metals are represented by all too brief chapters on carbonyls (H. Alper), nickel and palladium allyls (L. Hegedus), arenes (M. Semmelhack), and carbene complexes (C. Casey), which increase in utility and readability in the order given. The latter two types of complexes have great synthetic potential, which the chapter authors are exploiting; while the former have well developed chemistries unfortunately only sketchily treated here.

Concluding this volume are chapters on two fashionable topics: olefin metathesis (R.H. Grubbs) and hydrometallation (J. Schwartz). Justly, these chapters are heavy with mechanistic considerations, which, given the fluidity and rapidity of development of these subjects, should precede synthetic evaluation. The authors are to be congratulated for stressing practicability.

Overall, this book is praiseworthy for the speed with which it was put together. References to 1976 work abound, publisher and editor deserving high marks for getting into print within three months of the symposium. Also praiseworthy is the selection and coordination of topics, no obvious overlap, and few lacunae, thallium and magnesium were excluded due to thorough treatment elsewhere, but zinc and platinum could have merited chapters. Some odd constructions in the chapters by non-English native speakers, and typographical errors elsewhere can be excused, but offset printing from typescript and the lack of any indices do not excuse the price.

This book should be required reading for all synthetic organic chemists, but because of its topicality will surely become rapidly dated, as new techniques are uncovered, and limitations to present ones found. It is to be hoped a similar symposium will be organized every year or two.

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Les Composes Thiophosphororganiques; by L. Amasi, Masson, Paris, New York, Barcelona, Milan, 1976, 352 pages, Fr.f. 250.

Organothiophosphorus compounds are of importance to the organometallic chemist, especially their potential use as ligands, and information about their structure and reactivity is very useful. The book by Almasi provides an excellent source of such information. While the recently published series "Organic Phosphorus Compounds" (Edited by G.M. Kosolapoff and L. Maier) remains the prime source of data on individual compounds, the book by Almasi is the best source for information on classes of organothiophosphorus compounds.

The first part of the book emphasizes bonding and structure-reactivity relationships. The second part deals with various classes of compounds, and the third part is a useful account of the commercial uses of organothiophos-