

Book Review

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Modern organocopper chemistry

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The foundations of the modern organocopper chemistry are based on the pioneering work of Gilman (copper-mediated substitution reactions with ethyl copper and lithium dimethyl cuprate) and Kharasch (copper-catalysed 1,4 addition to conjugated enones). The subsequent work of House and Corey on conjugate addition and substitution reactions using organocuprates instigated the development of organocopper reagents for use in an extensive range of applications. In fact, today they are one of the most widely used classes of organometallic reagents. However, unlike other versatile metals, such as palladium, there have been very few books focused solely on the use of copper in organic synthesis. This book, *Modern Organocopper Chemistry*, written by an international group of experts, aims to fill that gap.

The book consists of ten chapters,

which are well referenced, and covers the literature up to and including 2000. Chapter one (Van Koten) discusses the structure of organocuprates and their tendency to aggregate. Chapter two (Knochel) reviews recent developments in the preparation of functionalized organocopper reagents *via* transmetallation reactions not involving organolithium reagents. This theme is developed further in Chapter three (Dieter), where the preparation of heteroatomcuprates and α -heteroatomalkylcuprates and their synthetic potential are described. Chapter four (Krause) looks at addition and substitution reactions of extended multiple-bond systems, illustrating that high regioselectivity and stereoselectivity can be achieved. Chapter five (Lipshutz) focuses on the use of Stryker's reagents in 1,2 and 1,4 reductions and the potential of using different phosphine ligands to control regio- and enantio-selectivity. Some very useful experimental detail is included. Chapters six to eight (Breit, Demel, Feringa and Backvall) combine to make an extensive survey of developments in asymmetric induction in conjugate addition and allylic substitution

reactions. This has been an area of rapid progress and some excellent enantioselectivities for alkyl transfer to cyclic enones indicate that they should find use in organic synthesis. Chapter nine (Yamamoto) highlights the use of organocopper reagents in natural product syntheses from the recent literature. Chapter ten (Nakamura) provides an illuminating overview of current thinking on the mechanisms of copper-mediated addition and substitution reactions.

Not only are the various copper reagents covered in good depth in this book, but many and diverse applications of these reagents are illustrated. Overall, the book is a valuable addition to the literature and will facilitate synthetic chemists in selecting appropriate copper reagents for their organic substrate and desired target molecule. It will also prove invaluable for organometallic chemists working in the field.

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