increasingly difficult for the synthetic chemist to keep up-to-date with the many variants of the reactions.

From the title of this latest volume in the series *Topics in Current Chemistry* one can assume that it is a practical handbook on the application of modern cross-coupling reactions. The reader is entitled to expect that the information contained in a "Practical Guide" will indicate which particular reaction is best for a given synthetic task. In order to then carry out the appropriate cross-coupling reaction and to achieve a high yield immediately, the reader also needs a detailed and reliable laboratory recipe, and these should be provided for a wide variety of synthetic applications. Unfortunately, however, on first glancing through the list of contents it becomes clear that the book only deals with a small selection of very new cross-coupling reactions. These are limited to reactions using organoboron, organosilicon, and organotin compounds, C–N and C–O bond-forming reactions, and arylation reactions by activation of C–H bonds. As explained in the introduction, the reason for this choice of topics was to avoid duplicating material in the book *Metal-Catalyzed Cross-Coupling Reactions* published by Wiley-VCH in 1998.

The introduction and Chapters 1–5 that follow have been written by well-known authors with a wealth of practical experience in their specialist fields. It is pleasing to find that the book is very up-to-date: the literature coverage extends to the end of 2000, and in some cases even to 2001.

Chapter 1, by N. Miyaura, is devoted to cross-coupling reactions using organoboron compounds. The author describes the main methods for preparing various organoboron compounds, and discusses their use in cross-coupling reactions, illustrated by examples. Different catalyst systems are described, and the effects of the choice of solvent and base on the reactions are discussed. The many detailed laboratory recipes should be especially useful for the synthetic chemist, making it possible to carry out the reactions described without time-consuming literature searches. Thus, Chapter 1 fully comes up to the promise in the book's title.

In the second chapter T. Hiyama and E. Shirakawa describe the possibilities for using organosilicon compounds in cross-coupling reactions. Many different types of reactions are discussed with the help of examples, nearly always accompanied by a laboratory recipe of a general kind. However, the introductory part, dealing with practical aspects of the reagents and coupling reactions, is perhaps rather too short. Also it would have been useful to give a survey of methods for synthesizing these reagents.

Chapter 3, by F. Fugami and M. Kosugi, is devoted to cross-coupling reactions using tin compounds, and has the advantage of a more detailed introduction. The chapter gives a good overview of the topic. Here too there are many explicit laboratory recipes, providing the user with detailed information about the experimental aspects of any synthesis problem. Both the preparation of organotin compounds and their use in cross-coupling reactions are treated in thorough detail.

Chapter 4 on C–O and C–N bond-forming reactions, by A. R. Muci and S. L. Buchwald, is the longest in the book. It provides the reader with an up-to-date survey of the many types of practical applications of transition-metal-catalyzed aminations and etherification reactions. Unfortunately, the reader will not find it easy to decide from this chapter which of the many catalyst systems described is most suitable for a particular synthesis. However, that difficulty seems unavoidable in view of the nature of the task, and cannot be blamed on the authors. These reactions are of great practical value, and that would have justified including even more laboratory recipes containing explicit details, and comparing them with regard to efficiency and practicability.

The last chapter, by M. Miura and M. Nomura, has the rather awkward title "Direct Arylation via Cleavage of Activated and Unactivated C–H Bonds". It contains a heterogeneous mixture of very interesting cross-coupling reactions, some of which are little known, such as the arylation of phenols and the coupling of arenes with olefins. A reaction of special synthetic importance is the rearrangement of enolates using aryl halides. Unfortunately, however, the synthetically very useful reaction for coupling ester-enolates and aryl halides to yield arylalkane acids, which was published in 2001, is not mentioned here. This chapter is especially well worth reading for catalysis specialists, but is not so useful as a guide for users of cross-coupling reactions, especially since not all the reactions described are supported by laboratory recipes.

To summarize, this book can be thoroughly recommended for all who have an interest in the cross-coupling reactions treated therein and wish to bring their knowledge up to date. It is especially valuable for synthetic chemists who use these reactions or plan to do so. However, the book does not completely fulfill the high expectations raised by the very general wording of the title. As it only deals with a selection of reactions, without mentioning standard methods such as the use of Grignard reagents or organozinc compounds, more space should have been given to comparing the coupling reactions described with other commonly used methods, and discussing the relative advantages and disadvantages. One would expect a work described as a practical handbook to give more guidance on which reagent is likely to be best for a given purpose, and to explain the limitations of the coupling reactions described.

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Stereochemistry. By *David G. Morris.* Royal Society of Chemistry, Cambridge 2001. 170 pp., softcover £ 9.95.—ISBN 0-85404-602-X

This short textbook is primarily directed at undergraduate students of organic chemistry and provides an introduction into organic stereochemistry issues. It is part of the Royal Society's new *Tutorial Chemistry Texts* series, and as such is comparable in both volume and price to Michael Robinson's book *Organic Stereochemistry*, which appeared in 2000 in the established *Oxford Chemistry Primers* series. In light of this, the question as to the need for (yet) another short text on stereochemistry arises, and has to be answered by Morris's book. I did not find a convincing answer. My overall impression is that the publication of this textbook was rushed. A little extra time devoted to eliminating the obvious mistakes, the more important of which are pointed out below, would have done the book a great favor.

The exact undergraduate level at which this text is pitched is unclear, because of a severe inconsistency in prerequisites. As an example, Chapter 1, within two pages, includes the use of line structures, invites students to practice the manual ring inversion of a cyclohexane chair model, and yet introduces conformational studies using ^{1}H NMR spectroscopy.

In many aspects, the material is not well presented. The following is a list of some of these. Orbitals are presented without phases, hybridized orbitals do not show back lobes, σ^* and π^* orbitals are introduced but not depicted (even though this would be useful in some discussions); most figures and schemes lack captions, detail is omitted in figures and schemes to an extent that some become incomprehensible, some axes are not labeled properly; obvious omissions in the choice of references and sources for further reading are irritating; the topic of (chiral) point groups is avoided, and so the discussion of achirality only focuses on symmetry planes and misses the important issue of centers of inversion (a molecule with C_i symmetry is achiral without a symmetry plane); charges in reaction schemes just vanish, and so do some reaction products, reaction arrows are not labeled with their reagents. Also, for a stereochemistry textbook that introduces hybridization and bond angles, some of the drawings of molecules are annoyingly inaccurate.

More serious than the above, especially in an undergraduate textbook that encourages self-study, is the apparent predisposition to generalize ideas that then become wrong: the ideal tetrahedral bond angle is always 109.5° and it cannot vary by a few degrees (if it does, it is no longer ideal); 1,4-disubstituted cyclohexanes without a stereocenter are discussed in a chapter entitled "Molecules with Two or More Stereogenic Centres" without any further explanation; the statement that "four different atoms…must be bonded to an sp^3 hybridized carbon to create a chiral molecule" does not hold true for a *meso* compound (a point that is correctly discussed in detail elsewhere in the book). The text is remarkably free of typographical errors, except unfortunately where it really counts: the maximum number of stereoisomers for n stereocenters is 2^n (as correctly stated in the text) not $2n$ (given as an emphasis in the margin and in the chapter summary); whereas cyclohexene is correctly described in the text as having four coplanar carbon atoms, it has "four planar carbon atoms" in the summary.

Somewhat irritating is the author's tendency to ignore certain (IUPAC) conventions. Even though IUPAC is mentioned in the preface, the usage of its terms in the text is neither systematic nor consistent, which, again, is unfortunate in an undergraduate text. And so conformations that should be termed synperiplanar and antiperiplanar are referred to as *cis* and *anti*, respectively (not even *cis* and *trans*, or *syn* and *anti*). Considering the fact that E and Z is the approved notation for stereoisomeric alkenes, it is also amusing to read that there is no "objection" to using E and Z rather than *cis* and *trans* for disubstituted alkenes even where *cis* and *trans* is "adequate".

Obviously a choice had to be made as to the topics covered, but I am unhappy about the omission of certain topics that would not have taken significant extra space. The importance of cyclohexane and its conformations is emphasized repeatedly, but nowhere is it mentioned that the boat conformation is an energy maximum and that chair and twist conformers are energy minima. In fact, the twist conformer is ignored almost entirely. The concept of the conformer is not covered at all. Pseudoasymmetry is not included. Chiroptical methods, and configurational analyses in general, are missing. Robinson's text (see above) covers all of these.

The feeling that publication had been rushed culminated in Chapter 7. This chapter (entitled "Substitution Reactions at Saturated Carbon") consists of just Section 7.1 "Nucleophilic Substitution". The Royal Society of Chemistry website for the book, on the other hand, has a link to an extensive addendum to Chapter 7 (45 pages covering Sections 7.2 to 7.9). From the addendum, it seems that Chapter 7 should be entitled "Stereochemistry in Reactivity". In terms of reactions, it covers everything that is obviously missing from the printed version: rearrangements, reactions of the carbonyl group, radicals and their cyclizations, elimination reactions, and pericyclic reactions (where orbitals are finally shown with their phases). It is clear that this addendum is indeed an afterthought, as the aims stated at the beginning of Chapter 7 do not cover any of the topics of 7.2 to 7.9.

On a positive note, and besides its appealing cover, this book has two features that Robinson's *Organic Stereochemistry* does not have. One is the use of red color in the presentation to emphasize important points. Each chapter begins with the aims and concludes with a summary, both presented in red-shaded boxes. Throughout the text, such boxes also offer additional thoughts and stimulate student participation. This is in line with the independent-learning philosophy that the *Tutorial Chemistry Texts* series advertises, as also is the good choice and number of worked problems, which in my view represent the second advantage.

It seems likely that this book will be reprinted soon to include the missing "half" of Chapter 7. Hopefully at that point the publisher will allow the author to remove the factual mistakes as well. This would lead to a much better text, and then the choice between it and Robinson's book would (almost) be reduced to personal preferences in what should be covered.

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Nanoscale Materials in Chemistry. Edited by *Kenneth J. Klabunde.*. Wiley-Interscience, New York 2001. 292 pp., hardcover $ 99.95.—ISBN 0-471-39395-3

The word nanotechnology raises high expectations. By altering the size-dependent properties of materials in defined ways on one hand, and combining that with a high integration density on the other hand, it should be possible to build complex machines with extremely small dimensions. The exciting possibil-

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