

courses in environmental law, planning and science. I have my doubts as to whether the lawyers will understand all of it; the analytical chapter, for example, will not be easily followed by those without a chemistry background. For this latter market, though, the book is generally successful; but perhaps even more usefully, it provides a source of information for the laboratory worker to see some of the 'real world' consequences of his/her toxicity or analytical studies.

The work is multi-authored by distinguished workers in the TBT field. In general, it is sensibly divided into chapters concerned with the manufacture, analysis, occurrence, fate and toxicity/biological aspects. The last two chapters discuss legislative and other legal aspects. The first chapter, by the editor, sets out the pros and cons of TBT use in the antifouling area. The chapter on manufacture (41 pages) is probably rather long for the bulk of the readership. My only structural criticism of the work is the existence of some overlap in Chapters 4–6, particularly in the fate and toxicity areas. Mention of 'imposex' and discussions thereon are scattered throughout the book, leading to something of a multiple coverage of this aspect. This is a small criticism, however, of a very useful work which I am very happy to recommend. It is very good value at £50.

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### **Organic Reactions, Vol. 50: The Stille Reaction**

V. Farina, V. Krishnamurthy and W. J. Scott

John Wiley, New York, 1997

xx + 676 pages. £70

ISBN 0-471-15657-4

This Golden Anniversary volume of *Organic Reactions* is devoted entirely to a review of the Stille reaction. This reaction, which was developed by J. K. Stille in 1978, involves the reaction of an organotin(IV) compound  $R^1SnR^2_3$  and a compound  $R^3X$  in the presence of a palladium(0) catalyst,  $Pd(0)L_m$ , to give the carbon-carbon-coupled product  $R^1-R^3$ .  $R^1$  is typically a vinyl, aryl, alkynyl, allyl or alkyl group,  $R^3$  is usually vinyl, aryl, allyl, benzyl or acyl, and X is a halide or sulphonate.

Similar reactions of the organic compounds of magnesium, zinc, boron and silicon are known, but the stannanes show a convenient balance of stability and reactivity: their use has been widely developed and exploited in recent years, and the Stille reaction has been used with spectacular success in the final or late stages of synthesis of some natural products. The reaction was reviewed by J. K. Stille in 1986 and by T. N. Mitchell in 1992, and recent advances were described by V. Farina and G. P. Roth in 1997, but a comprehensive and authoritative review has been urgently needed before the subject grows to an unmanageable size.

Following the established pattern of *Organic Reactions*, the volume starts with a rather brief discussion of

the mechanism, regiochemistry and stereochemistry of the reaction, and of its scope and limitations. The stannane reactants are usually stable to air and moisture, and are unreactive towards most types of functional groups which may be present in  $R^3X$ , and which therefore do not need protecting. When the reactivity of the stannane is low (e.g. when  $R^1$  is alkyl), the reactivity can be enhanced by working with a polar aprotic solvent such as DMF, DMSO or HMPA, and a weak ligand L, such as triphenylarsine or tri(2-furyl)phosphine, rather than triphenylphosphine. If the reactions are run under an atmosphere of carbon monoxide, a carbonyl group can be incorporated into the product  $R^1COR^3$ ; further modifications of the process involve organostannanes where  $R^1$  is H,  $R_3Sn$ , RO or  $R_2N$ . This introductory section of 60 pages ends with a discussion of the experimental conditions and nine examples of typical preparations.

The rest of the book is occupied by a series of tables, classified mainly on the basis of the nature of the group  $R^3$  in the electrophile  $R^3X$ . The substrate, stannane, conditions, yield and reference are given, and the literature is covered up to the end of 1994, with some selected references from 1995. These tables occupy 560 pages and include some 5000 examples of the reaction. There are 865 references.

This is a worthy anniversary volume in this renowned series, and will be a valuable source of information for all synthetic organic chemists.

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### **Theoretical Aspects and Computer Modelling of the Molecular Solid State**

Angelo Gavezzotti (ed)

John Wiley and Sons, Chichester, 1997

237 pages, £70

ISBN 0-471-96187-6

Molecular solids are those solids where the forces between neighbouring particles are much weaker than the forces within the particle. Solid phases of neutral organics and organometallics are molecular; ionic, covalent and metallic solids are not. In this book, Volume 1 in the series *The Molecular Solid State*, the structures and morphologies of molecular solids and their thermodynamic properties and phase transitions are described and explained in terms of the intermolecular forces which keep the molecules together. It is a welcome and timely addition to the scientific literature in the rapidly developing field of computer simulation of intermolecular interactions. It comprises seven chapters, each written by an expert or experts. In his foreword J. D. Dunitz, the Series editor, points out that the weak intermolecular interactions, which include hydrogen bonding, are responsible for the existence of the organic world; that the long-range periodic order of a crystal is a