Solvents and Solvent Effects in Organic Chemistry

Certain monographs are so unique and of such a high quality that they can justifiably be called a standard. "Reichardt" is one of those books. Since its first edition back in 1979 it has been improved continuously. Its goal was always to cover the chemistry of solvents exhaustively in a comprehensive volume. I myself present a series of lectures on "Physical Organic Chemistry" at the University of Cologne, which is strongly based on *Solvents and Solvent Effects in Organic Chemistry*. So the question arises whether it is sensible to review such a well-known "heavyweight" at all.

In practice, there are surprisingly many organic chemists who handle solvents in a virtuoso manner without being familiar (or familiar enough) with the essentials of solvent chemistry. A "brilliant organic chemist" is often someone who is able to "cook", meaning that he has a gut feeling for how to handle a problem in synthesis. Reichardt's and Welton's book aims to improve that situation by providing a comprehensible description of the sensible use of solvents, and by showing how their properties can be described not only qualitatively but also quantitatively. To illustrate this, Tom Welton quotes Lord Kelvin: "*When you can measure what you are speaking about and express it in numbers, you know something about it.*"

A major focus of this book is the description of solvent properties and solvent effects with the aim of quantification, which makes it possible to compare solvents meaningfully. Thus, the contents are organized in a logical manner, starting from a description of the fundamental interactions in solution and the possible ways of using these as a basis for classifying solvents. A substantial part of that deals with the definition and experimental determination of solvent polarity. This is unsurprising, since one of the standard methods for the determination of solvent polarity uses "Reichardt's dye", as developed by the first author. The other chapters are devoted to solvent effects on chemical equilibria, on reaction rates, and on absorption spectra of organic molecules.

In addition to some minor editorial improvements, the updated edition features a new eighth chapter on "Solvents and Green Chemistry" (40 pages). This chapter has been written by Tom Welton, who is undeniably one of the leading scientists in the field. The chapter is real added value, and this in itself makes it worth buying the new edition. Welton gives a concise introduction to the field of green chemistry, and explains that many problems in sustainable chemistry can be ascribed to solvents. He follows that with a description of the properties and effects of modern unconventional solvents (water, supercritical phases, ionic liquids, PEGs), and gives examples of recent industrial applications. The chapter ends with an assessment of the prospects for biomass-derived solvents.

In summary, the book covers the topic "solvents in organic chemistry" with a comprehensiveness and competence that cannot be found in any other work. The updated edition, with the new chapter, is an extremely well-written and well-organized book which should be on the bookshelf of each and every synthetic organic chemist.

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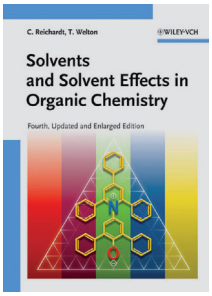

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