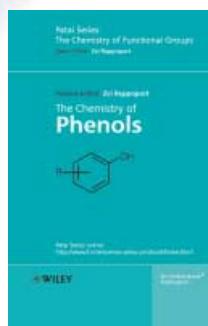


The Chemistry of Phenols



Vols. 1 & 2 of Series: The Chemistry of Functional Groups. Edited by Zvi Rappoport. John Wiley & Sons, New York 2003. 1000 pp., hardcover € 1099.00.—ISBN 0-471-49737-1

Saul Patai, who died in 1998, founded the comprehensive series of books about the chemistry of functional groups. These books by Patai belong to the standard inventory of scientific libraries. Zvi Rappoport continued with the extension of the Patai series as sole editor, and two volumes recently appeared dealing with the chemistry of phenols.

Zvi Rappoport has organized numerous scientists who are well known in their respective fields to write the contributions, covering the literature mostly up to mid-2002. From the arrangement of the 20 individual chapters, it is difficult to find a unifying concept of the book.

After an introduction, which is worth reading and provides a good historical survey, the first chapter deals with the theoretical aspects of phenolic compounds. The figures on colored pages are repeated unnecessarily in black-and-white in the body of the text. Whereas single lines in chemical formulas usually describe C–C bonds, in some drawings of this chapter they are used to represent the protonation of arenes (pp. 86/88). Furthermore, showing double bonds in the structures of

Table 27 would be helpful for the reader's understanding. Two short reviews on the structure and thermochemistry of phenols succeed in completing the physicochemical picture. The next two essays, dedicated to NMR and IR spectroscopy, are brilliant in their outline, and will serve practically orientated chemists as a valuable reference source. The UV/Vis spectroscopic properties of these compounds are discussed in Chapter 7, but before that, in Chapter 6, there is a summary of methods for the synthesis of phenolic compounds. The selection of synthetic methodologies and examples focuses on practical aspects, resulting in an excellent synthetic guide. The eighth chapter is concerned with the hydrogen bonding of phenols, which very often triggers the reactivity of these compounds. Surprisingly, the intermolecular interaction of naphthols and naphthylamines is not mentioned, despite their synthetic significance. The following contribution about electrophilic reactions covers a very wide scope and unfortunately only superficially in some parts. Therefore, it is not surprising that most parts of this summary are found in other chapters as well. More specific subjects such as the iodination of phenols are given only a single reference, which definitely does not meet the requirements of the Patai books. The next contributions are dedicated to the applications of phenols in synthesis and catalysis, including detailed reports on tautomeric equilibria and their use in rearrangements.

The second volume starts with the use of phenols as antioxidants, a very important technological application. This chapter is followed by an essay about the analytical aspects of phenolic compounds, which would fit better into the first volume. All three succeeding contributions are dedicated to free radicals generated by photochemical means or radiation, and to their reactive properties. A comprehensive chapter of almost 200 pages deals with the oxidation of phenols. Although the enantioselective oxidative coupling reaction of phenols and naphthols is a significant and important research area, it receives only scant attention. After a short essay about the environmental aspects of phenols, the reader encounters two massive contributions about oligomeric

and polymeric phenols, which conclude the second volume. The review of calixarenes will be of particular interest for chemists working in the field of supramolecular chemistry, where the calixarenes serve as indispensable building blocks.

The book contains an author index of more than 100 pages, whereas the subject index is only about a third of that length. But the reader will find the desired subject without any problems, provided that he or she does not choose a general topic: although "oxidative coupling" is treated in almost every chapter in multiple ways, the index gives only one reference.

The schemes are clearly arranged and the numbering is systematic for the individual chapters. The number of typos in the written part and the schemes is at a tolerable level. Chemical mistakes are rare, and are obvious even for the inexperienced reader (e.g., p. 140, free-radical mechanism). Of course, this monograph cannot cover all aspects, and accordingly the editor regrets the absence of a contribution dealing with the acidity of phenols. However, with more than 6000 references and many citations leading to existing reviews and further reading, the book represents an indispensable reference book that should find its place in every scientific library. Most chapters are of textbook style, and give the interested chemist access to quick and comprehensive information on specific subjects. With the high quality of this valuable book, Zvi Rappoport has definitely lived up to the expectations of the late Saul Patai.

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