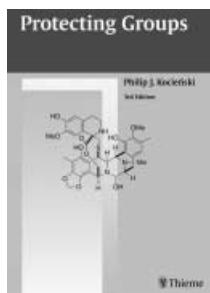


## Protecting Groups

by P. J. Kociński

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## An In-Depth Treatise

Because organic chemistry usually takes place at functional groups, the presence of several of them frequently necessitates the use of protecting groups if a selective transformation is desired. Only the proper selection of protecting groups combined with a good synthetic strategy can lead to a successful total synthesis. The book by Kociński which is now in the 3<sup>rd</sup> edition provides the reader with an in-depth treatise about protecting groups. The book is divided into eight chapters. Chapter 1 provides a comprehensive overview about important issues in protecting group chemistry. Thus, the ideal protecting group should be stable to the widest possible range of reaction conditions and it should be possible to remove it selectively. The failure to achieve the latter is very often the dead

end of a synthesis. Kociński classifies the protecting groups into 13 orthogonal sets regarding their removal, such as acid or base sensitivity, reductive elimination and so on. Each of the sets is illustrated with appropriate examples. Other general topics in the first chapter include relay protection, that is the conversion of a stable group into a labile one prior to the cleavage, mutual protection (protection of more than one functional group with one protecting construct), temporary protection and special effects such as neighboring group participation, stereoelectronic and coordination effects. A further subchapter is devoted to protecting groups in solid-phase synthesis. The remaining seven chapters deal with protecting groups for the various classes of functional groups. First, the methods for cleavage are summarized followed by methods for introduction. Chapter 8 is followed by an epilogue which contains several challenging problems. Every chapter is concluded with numerous references to the newest original literature and to important review articles.

Since the removal of protecting groups is based on fundamental organic concepts, like stability of carbocations, ease of deprotonation or oxidation, it is to some degree a book about modern organic synthesis. It also serves to illustrate chemical reactivity. Thus, one can find pK<sub>a</sub> values of various compounds, bond strengths and relative rate data. The functional groups where the action takes place are highlighted with blue color. One has to say that the schemes are beautiful and very aesthetical. The schemes even contain the scale on which a certain reaction was done. Occasionally, Kociński has included some philosophical and witty

statements that are highly refreshing and pithy.

This book must of course be compared with the Greene/Wuts book<sup>[1]</sup> which is a more compact compilation. If one is in a hurry, which is usually the case, it is probably faster to find a protecting group in the Greene/Wuts book. The Kociński book requires more reading but also a better understanding. What is somehow missing is a systematic discussion of which protecting groups should be chosen for a complex synthesis. To some degree it can be gleaned from the examples given in the book. Most of this knowledge still must be gained by hard experience. In addition, the concept of modulated lability is underrepresented in this book.

Clearly, the book is an amazing compilation of organic chemistry and one must compliment Professor Kociński on this fantastic selection of suitable examples. It is my hope that the book stimulates the development of new protecting groups and new chemistry. I recommend the book for everybody who is seriously involved in the synthesis of complex organic molecules.

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[1] T. W. Greene, P. G. M. Wuts, *Protective Groups in Organic Synthesis*, 3rd edn., Wiley, New York, 1999.