Classics in Spectroscopy

In their book *Classics in Spectroscopy—Isolation and Structure Elucidation of Natural Products*, Stefan Berger and Dieter Sicker present 30 "classic" natural products and demonstrate how these compounds can be isolated and how their structures can be determined by modern spectroscopic methods. Thus, the concept used successfully by K. C. Nicolaou and E. J. Sorensen in their book *Classics in Total Synthesis*, in which the total synthesis of selected natural products was discussed in detail, has been applied to spectroscopy by the authors of the present book.

The natural products selected for *Classics in Spectroscopy* are discussed in six chapters devoted to specific compound classes. In the first chapter, alkaloids such as nicotine, caffeine, piperine, galanthamine, and strychnine are presented. Next, aromatic compounds such as eugenol, chamazulene, and tetrahydrocannabinol are discussed. The third chapter is devoted to pigments, such as lawsone, curcumin, and indigo. In the next chapter, sugars such as lactose and amygdalin are discussed. The fifth chapter is devoted to terpenes, such as limonene, menthol, abietic acid, and betulinic acid. The last chapter deals with compounds that could not be assigned to one of the above classes, namely shikimic acid and aleuritic acid.

Each of the selected natural products is treated in a subchapter that consists of 10 to 25 pages, depending on the degree of difficulty. For each natural product the discussion begins with an elaborate general introduction, in which one learns about its discovery, origin, history, uses, and properties. That is followed by a list of literature references, of which some are of historical interest and others are of importance in a modern context. Next, the authors describe the isolation of the natural product in detail and report about their own experiences, since each of the natural products has been isolated by the authors themselves. That is followed by reproductions of high-quality infrared, NMR, and mass spectra, which have also been recorded by the authors themselves. The NMR spectra were recorded with modern high-field NMR spectrometers and include ^{1}H NMR, COSY, APT-^{13}C, HSQC, HMBC, and NOESY spectra—thus presenting examples of all variants of NMR spectra that are of importance for the structural elucidation of natural products. Moreover, for many compounds the authors also present UV spectra, and for optically active compounds that show Cotton effects CD spectra are also included. Underneath the spectra, the structural information deduced from the spectra is discussed. The NMR spectra are discussed most comprehensively, but also the fragmentation patterns of EI mass spectra are explained in detail. After the discussion, the results obtained by interpretation of the NMR spectra are presented in the form of a well-arranged table containing the complete assignment of all proton and carbon resonances.

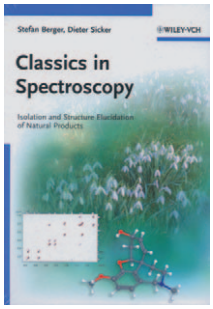
Following the interpretation of the spectra, the authors usually ask several comprehensive questions. Some questions are concerned, for example, with specific properties of the natural product, or its synthesis or biosynthesis, but most of the questions are about the spectra. They are intended to stimulate the reader to study the information about the corresponding compound in depth. Answers to the questions can be found at the end of the book.

It is important to mention that the book is unusually well-illustrated with pictures. Also, in the margins of the book there is interesting additional information that one does not usually find in textbooks dealing with chemistry. For example, there are literature references from novels and poems in which the natural product itself, the name of the compound, or the name of the organism from which it was isolated is mentioned. The citations are presented in the original language, and at the end of the book a translation into English can also be found. To take an example, the chapter about galanthamine contains wonderful pictures of daffodils, snowdrops, and the bulbs from which the compound was isolated, and there are also several pictures showing the process of isolating galanthamine from the bulbs. Moreover, there are appropriate quotations about galanthamine from Ovid, August Strindberg, William Wordsworth, Hans Christian Andersen, and Hermann Hesse.

The book contains a comprehensive index of chemical substances, a general subject index, a name index, and an index of spectra, which makes it easy to find any kind of information contained in the book.

The authors have succeeded perfectly in selecting 30 of the most important natural products from the large number of known ones, and in presenting their structure elucidation in an especially attractive form. It is pleasing to report that I could not detect any serious mistakes in this quite comprehensive piece of work, showing that the authors evidently composed this book with special diligence.

The book is perfectly suited for a lecturer giving a course on structure elucidation for students who are already familiar with the basics of spectroscopy, since—besides the necessary excellent spectra—it contains a wealth of information of every conceivable kind about the individual compounds. Moreover, many students who are interested in structure elucidation will have their enthusiasm stimulated



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by this book. Therefore, I wish this excellent book a wide circulation and readership, and I recommend it exceptionally, as *Classics in Spectroscopy* promises to become itself a classic textbook because of its unusual and extraordinarily appealing concept.

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