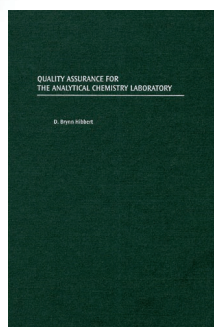




Quality Assurance for the Analytical Chemistry Laboratory



By D. Brynn Hibbert. Oxford University Press, New York 2007. 320 pp., hardcover
£ 58.00.—ISBN 978-0-19-516212-7

Quality assurance (QA), as a special aspect of research and teaching, has not always had an easy time of it in the past in the scientific world—even in analytical chemistry—and has often either been acknowledged only as a fringe subject or, in the worst cases, completely ignored. However, in analytical chemistry, there has been a noticeable change in the last few years. Through the influence of national and international metrological institutions and norm-setting committees, the stricter requirements for the quality and safety of industrial products, and conditions imposed by regulatory bodies, especially in the pharmaceutical industry, the subject of quality assurance has also become incorporated into university courses. Evidence of this growth in importance can be seen in the many new books on QA that have appeared in the last few years.

In this book, David Brynn Hibbert, who is Professor of Analytical Chemistry at the University of New South Wales, Sydney, and is also well known as a co-author of *Data Analysis for Chemistry* (Oxford University Press, 2005), gives, in ten chapters, an intro-

duction to the different aspects of quality assurance, and describes its basic tools.

An abstract term such as “quality” must first be precisely defined, especially for scientists. Therefore, the author begins in Chapter 1 by considering what is meant by quality, and he attempts to collect and summarize the many definitions of this difficult term for the reader. Closely related concepts, such as quality management systems, quality control, the recently coined term “qualimetrics”, and lastly quality assurance, are discussed.

Chapter 2 deals with the basic principles of statistical data evaluation, without claiming to give an in-depth treatment of the subject. Readers who seek a more advanced and deeper mathematical introduction to statistical methods are referred to appropriate textbooks; here, of course, the author does not forget to mention his own book on this subject.

The third chapter is devoted to the systematic optimization of analytical methods (as opposed to “trial and error” methods, which are usually very time-wasting), with an emphasis on the quality of the data that are produced. Here, although Hibbert occasionally cites the classical situation of optimizing the choice of mobile phase in HPLC as an example, most of the discussion is very abstract from the reader’s viewpoint, and it would have been desirable to relate it to other types of situations and to examples from laboratory practice.

The following chapters are dedicated particularly to the tools used in quality control. The book emphasizes the use of graphical presentations (such as various flow diagrams) and discusses different techniques for analyzing and presenting data (for example, different types of data plots). The author also devotes separate chapters to interlaboratory comparisons, measurement uncertainty, traceability, and method validation. These can be read and understood independently without having previously studied the rest of the book. Although the chapters offer the reader a sound and precise knowledge of their topics, one often wishes while reading the book that many more examples from practical situations had been included.

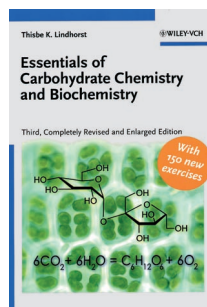
The book ends with a chapter on accreditation, which gives the reader a short but information-packed introduction to this subject, about which one could easily fill another book.

The book can be recommended to everyone who wants a first overview of the subject of quality assurance in analytical chemistry, and especially to readers who are beginning a career in analytical sciences. Although the author has written the book in a style that is relaxed and attractive to the reader, it is more suitable for those readers who will appreciate a rather abstract approach to a new subject. Students should therefore carefully compare the many books on QA that are available, and consider whether there is one or another that might be more appealing in its presentation.

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Essentials of Carbohydrate Chemistry and Biochemistry



3rd ed. By Thiesbe K. Lindhorst. Wiley-VCH, Weinheim 2007. 318 pp., soft-cover € 59.90.—ISBN 978-3-527-31528-4

The chemistry of carbohydrates and its modern interdisciplinary branch of glycobiology enjoy the reputation of demanding a great deal of intellectual activation energy from their novices. Accordingly, one must place a high value on any author’s attempt to offer a scientifically sound, didactically clear, but also stimulating approach to this highly topical field of research in the form of a textbook. *Essentials of Carbohydrate Chemistry and Biochemistry*, by

Thisbe K. Lindhorst, now in its third edition, is the successful result of exactly such an endeavor.

Comparing the present book with the previous edition, one immediately notices a considerable increase in size. The roughly 100 additional pages can be attributed primarily to the inclusion of much new content, although the increase is also partly due to the substantially enlarged and updated lists of references at the end of each chapter. The organization of the chapters basically follows the excellent structure of the predecessor volume, with a clear separation between synthesis-oriented sections (Chapters 2–5 and 8), in which the foundations of carbohydrate chemistry are presented to the reader, and those of a biochemical nature (Chapters 6 and 7). A slightly varied sequence of topics in the former group enhances the inherent logic of the presentation. At this point one should also mention that both the list of contents and the subject index are sufficiently detailed to facilitate orientation within the text.

In the following, I will comment briefly on the main extensions and modifications of the various topics covered. Chapter 2 on the structure of carbohydrates has been enlarged by adding a section on the conformational analysis of saccharides. On the theme of protecting-group methodology (Chapter 3), the author describes the applications of enzymes, of orthogonally protected carbohydrate scaffolds, and of special protecting-group patterns in the case of allyl mannosides. The chapter on modifications (Chapter 4) has been extended by including sections on the important class of anhydro sugars and on functionalization reactions of the anomeric center. Discussions about solvent effects and solid-phase oligosaccharide synthesis have newly entered the following chapter on the synthesis of O-glycosides. Here one also finds a really exemplary up-to-date list of references, categorized under original papers

and review articles. Incidentally, it would also have been desirable to have an equally good literature coverage in the chapter on glycoconjugates (Chapter 6), which has been rather neglected in this respect. As the field of glycobiology is currently undergoing rapid development, Chapter 7 on this area has undergone the most substantial changes. Here one finds novel sections about the relevance of oligosaccharide epitopes in cell biology, the molecular interactions of the glycocalyx carbohydrate microarrays, a range of topics concerning biochemical engineering, and the development of carbohydrate-based drugs.

As the author mentions, she addresses the book especially to non-carbohydrate chemists or those who want to gain access to the admittedly complex world of glycoscience. For this readership, the more elementary chapters 1–5 and 8, which cover the basic facts about the structure, synthesis, and analysis of carbohydrates, will be directly useful and comprehensible. In these sections the author's presentation is exceptionally lucid, and the integration of reaction mechanisms with practical protocols makes this book suitable reading for students, as well as a first source of information for use in the laboratory.

However, the chapters on biological aspects (glycoconjugates and glycobiology) present a distinct contrast. They serve rather as appetizers, and give a highly condensed overview of some biologically relevant applications or areas of recent research within glycobiology, such as the structure and synthesis of glycoproteins, glycolipids, and glycosphingolipids, carbohydrate–protein interactions, multivalency, carbohydrate-based vaccines, etc. Accordingly, the presentation of these topics is sketchy, even cursory when compared with the more basic chapters. This is reasonable to keep the number of pages to an acceptable level, but with the needs of

students in mind one would like to get a more comprehensive introduction. Perhaps that will be the subject of another volume as a sequel to Lindhorst's present book.

Some mild criticism is appropriate with regard to the quality of various pictures, as well as the lack of consistency in the layout of formula schemes. Apart from this, the inclusion of exercises and problems in several chapters is greatly appreciated. However, these often confine themselves to a mere recapitulation of the chapter's contents. The book could be improved by including a greater number of more advanced problems, which would go beyond the limits of a single section and stimulate the reader's intense intellectual encounter with the particular topic. As a final remark, references to several excellent monographs would probably enhance the usefulness of the more biologically oriented chapters for some readers.

In summary, the third edition of this well-established textbook can be recommended unreservedly for a wide readership. Because of the clear conceptual organization, it can be used both as a reference source for the basic facts of carbohydrate chemistry (including laboratory protocols, e.g., for practical courses) and, for intrepid committed readers, as an entry into the fascinating research area of modern glycobiology. Therefore, this up-to-date and well-structured book is recommended warmly to every student who is eager to get more involved in various aspects of carbohydrate chemistry. In short, *Essentials of Carbohydrate Chemistry and Biochemistry* should be available in every well-equipped library or collection of textbooks.

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