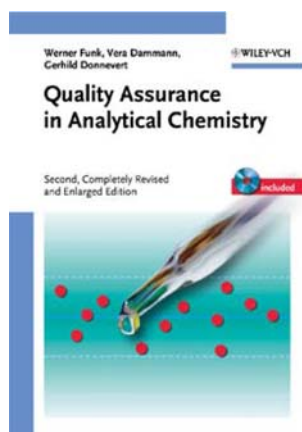


Werner Funk, Vera Dammann, and Gerhild Donnevert: quality assurance in analytical chemistry: applications in environmental, food, and materials analysis, biotechnology, and medical engineering, 2nd ed

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Bibliography

Quality assurance in analytical chemistry: applications in environmental, food, and materials analysis, biotechnology, and medical engineering, 2nd ed.
Werner Funk, Vera Dammann, and Gerhild Donnevert
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Book's topic The book provides a step-by-step guide to establishing a quality-assurance/quality-control (QA/QC) system for any chemical analysis. Although the book's subtitle lists five application areas, these areas are not specifically addressed. The process would be applicable to other areas of analytical chemistry (e.g., clinical analyses).

The process is divided into four phases: establishing the quality characteristics of a new method, making the process operational, use of the process through routine analysis, and external QA through interlaboratory comparisons and audits.

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Contents The book is divided into six chapters, four of which describe the four phases mentioned above. The remaining two chapters provide an introduction and definitions. Sample calculations and statistical tables are provided in appendices. A CD contains examples and also allows the user to enter his or her own data for calibration and control charting, among other things. The first edition of the book was published in 1995; this second edition (2007) has been updated to include discussion of measurement uncertainty as described in the ISO *Guide to the Expression of Uncertainty in Measurement* and the Eurachem/ CITAC guide, *Quantifying Uncertainty in Analytical Measurement*.

Comparison with existing literature The information provided in the book is similar to information provided in other books that describe the use of statistics in analytical chemistry. However, unlike many texts, this one provides a discussion of practicalities such as matrix effects, criteria for selection of an internal standard, and a list of potential sources of error. Also, unlike others, it provides a thorough overview of the use of control charts. The book is written by experienced analytical scientists with training in statistics rather than the converse, and the insights that this brings to the process are obvious. [The late Werner Funk was professor at the University of Applied Science in Gießen-Friedberg (Germany). Vera Dammann and Gerhild Donnevert both continue to work at this institution.] The provision of a CD with spreadsheets into which the user can plot his or her own data is also, perhaps, unique, although information related to the spreadsheets is not integrated with the text.

Critical assessment The book is very prescriptive: the reader is instructed on what to do but this information is often not placed in a context of why it should be done; it is, therefore, difficult for the user to consider alternatives. The

user can follow the processes through detailed flowcharts, which do sometimes provide a choice among alternatives.

In the discussion on control materials, the authors address natural samples (the analysis of which can indicate precision but not accuracy), spiked samples (the analysis of which *might* indicate analyte recovery, although the limitations of this approach to estimating recovery are not discussed), and certified reference materials (CRMs, which are too expensive for routine use and are, therefore, omitted from the section describing routine quality control).

Unfortunately, the authors fail to recognize that the expense of CRMs can be offset by economic consequences if inaccurate results are generated and used for decision making (e.g., The economic impacts of NIST's cholesterol standards program, September 2000; http://www.nist.gov/director/planning/impact_assessment.htm).

Readership recommendation This book should be a useful reference for a practicing analytical chemist or quality-control officer who wants to build a QA/QC system from the ground up. The book is also a useful guide for documenting the quality of existing analytical systems, particularly for building and interpreting control charts.

Summary This is a useful handbook for the analytical chemist or quality-control officer who is trying to achieve quality measurements and needs to demonstrate the sustained quality of those measurements.

Disclaimer Certain commercial products are identified to specify adequately the experimental procedure. Such identification does not imply endorsement or recommendation by the National Institute of Standards and Technology, nor does it imply that the materials identified are necessarily the best available for the purpose.