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# Book reviews

**W. Funk, V. Dammann, G. Donnevert, Quality Assurance in Analytical Chemistry, Second edition, including CD, Wiley-VCH, Weinheim, Germany, 2007 (xxiii + 277 pp., £95.00, ISBN 3-527-31114-9)**

Qualitative and quantitative physical and chemical measurements/analyses are involved in many aspects of life, from contents of organic and inorganic compounds in our environment (pollution measurements), foodstuffs (nutritional labelling and adulteration monitoring), and pharmaceuticals (therapeutic dosage determination), to the analysis of our own bodies (preventative analysis and clinical diagnosis). The objective of such determinations is achievement of reliable results of defined quality. Quality characteristics are described by their specificity, selectivity, sensitivity, and accuracy. Specificity is the ability of an analytical process to register the desired analyte(s) in all relevant forms, selectivity is the ability to register only the desired analyte(s) without interference from other components in the sample matrix, sensitivity is the change in measured value per change in analyte concentration, within suitable lower and higher limits, and accuracy in the sense of both 'trueness' (lack of systematic errors) and 'precision' (lack of random errors that cause significant reproducibility errors for repeated analysis of the same sample). The objective of analytical quality assurance is to obtain reliable analytical results, the accuracy of which is determined, regularly verified, and documented. Determination, improvement, and maintenance of the quality of analytical results are prerequisites for laboratory accreditation.

'*Quality Assurance in Analytical Chemistry*' begins with an introductory overview of analytical chemistry quality assurance (Chapter 0), and introduces a proven and integrated concept for quality assurance consisting of four phases. Phase I (Chapter 1) is concerned with determination of quality characteristics when establishing a new analytical procedure. Before a new analytical procedure, especially one requiring calibration, can be used for routine analysis, the individual steps need to be determined and optimised, and the entire fundamental analytical procedure verified for its performance. Performance characteristics obtained in this way are documented and/or published with the description of the analysis and form the basis for later quality assurance in routine analysis. Specific topics discussed for Phase I in this chapter include fundamental calibration and analytical range establishment, standard preparation, linear and second-order calibration functions, precision, securing the lower range limit, minimum detectable value and quantification limit, systematic errors, statistical methods, internal standards, time dependency, and 'within-batch' and 'between-batch' standard deviations.

Phase II (Chapter 2) involves preparative quality control, where an analytical process for which quality characteristics have been documented (Phase I) is made operational for routine analysis. Phase II begins with a 'training' phase, that includes determination of the quality required as well as testing and improvement of the quality achieved by the analytical process, and ends with the preparation of quality control charts for the routine user to follow. Specific topics discussed for Phase II in this chapter include quality objectives, control samples for internal quality assurance, and extensive detailed information on the control chart system. Phases III and IV (Chapters 3 & 4) cover internal laboratory quality assurance measures of routine analysis (both of a statistical and process technological nature), and external laboratory quality assurance in the form of interlaboratory tests and external audits, respectively. Chapter 5 provides definitions of quality and quality management, analytical terms, analytical results, deviation and uncertainty, materials and samples, and statistical tests, whilst Chapter 6 contains references. Appendices containing sample calculations and statistical tables, and a CD containing examples, checklists and statistical tables, are also provided.

In conclusion this informative volume is useful for researchers involved in the development of rigorous analytical methods according to the principles of Good Laboratory Practice (GLP), not only for accreditation purposes, but also for general routine analytical laboratory purposes.

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