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Book Review

WERNER FUNK, VERA DAMMANN and GERHILD DONNEVERT

Quality Assurance in Analytical Chemistry: Applications in Environmental, Food and Materials Analysis, Biotechnology and Medical Engineering

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This is the second, completely revised and enlarged edition of the book; there are five chapters, three appendices and an accompanying CD-ROM. The software comprises Microsoft Excel spreadsheets, incorporating statistical tables and examples of statistical procedures for quality assurance (QA), which can be used for the analysis of data produced by the reader. This edition has been produced ten years after the first and since then a number of developments and changes in analytical chemistry have occurred. This is reflected in this book by inclusion of a chapter on measurement uncertainty and the inclusion of the CD-ROM, to illustrate the concepts described in the text.

The work is an extensive treatise of the subject with a wide and in-depth coverage. This is best illustrated by briefly considering the subject matter in each of the five chapters of the book. The introduction covers differentiation of the analytical process, quality of analytical processes and results, the system of QA and summarizes the authors proposed four-phase model of analytical QA. The second chapter (Phase I, establishing a new analytical procedure) deals with verification of linearity and precision, minimum detectable value, limit of quantification, matrix effects, systematic errors, recovery, internal standards, within and between batch standard deviation. Chapter three (Phase II, an analytical process becomes routine; preparative QA), details the selectivity of the procedure, working range, calibration, external and

internal quality objectives, control samples, types of control samples, standard solutions, blanks, natural samples, spiked natural samples, certified reference materials and control charts. The important subject of control charts is extensively dealt with and includes: Shewart charts, range control charts, difference charts, standard deviation charts, target value charts and cusum charts. The forth chapter (Phase III, routine quality assurance) covers laboratory management, personnel, maintenance of equipment, materials, measurement uncertainty and the associated Eurachem Guide to measurement uncertainty and routine quality control. The penultimate chapter (Phase IV, external analytical QA) describes audits, round-robin tests and quality management systems. The final chapter (Phase V) lists appropriate definitions.

The above contents summary illustrates the in-depth coverage of the book, and the approach the authors have taken to delineate the QA process for analytical measurement, into four separate phases or steps. As such it gives the practitioner, or team-member responsible for setting up a QA system, an invaluable blueprint to use when implementing a system from scratch. Whilst the nature of this subject area does not lend itself to being particularly easy for the non-expert, the authors have used a number of methods to express the important concepts, including figures, plots, graphs, mathematical equations and some good examples. The text book is suitable for the practitioner who wishes to understand all the steps that are necessary for analytical quality and is to be highly recommended for its depth and comprehensive nature, whilst still maintaining accessibility. It performs the role of reference manual, text book and outline for developing QA systems for a modern analytical laboratory.

C.F. Harrington

Nottingham Trent University Nottingham, UK