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Book Review

Principles of Analytical Chemistry: A Textbook

M. Valcárcel; Springer-Verlag, Berlin, 2000, xv + 371 pages, ISBN 3-540-64007-X, £?

Analytical chemistry is a vast subject area, which can be somewhat overwhelming to the fresh-faced student or novice researcher. This informative volume does not aim to teach the myriad of techniques and methodologies that are covered in more conventional texts, but concentrates on the structure of analytical chemistry by providing an introduction to analytical concepts, how to obtain analytical data, and how to interpret it.

The first chapter provides a concise introduction and brief history of analytical chemistry, and is followed by information on analytical properties. Specific topics covered include accuracy, precision, sensitivity, selectivity, cost effectiveness and analytical property relationships. This leads nicely into the next chapter, which focuses upon traceability, with particular emphasis on reference materials, standards, and their associated documentation. The fourth chapter outlines measurement processes, with considerable emphasis being placed on signal measurement, data processing and interpretation, and progressing onto process validation. The qualitative and quantitative aspects of detection and identification are extensively covered in chapters five and six. Specific topics covered in these sections include the binary response, classical and instrumental qualitative analysis, and absolute and relative quantitation methods. Specific techniques discussed include gravimetry, coulometry, isotope dilution mass spectrometry and titrimetry.

The penultimate chapter considers the factors involved when designing a programme to solve an analytical problem, focusing upon the individual steps involved in the analytical problem-solving process, such as identifying the analytical information required, planning the analytical approach, monitoring the results, etc. This leads into the final chapter, which discusses the important area of quality, presenting useful information on quality systems (quality assurance, ISO, GLP), quality control, proficiency testing, and the costs and benefits of such analytical quality systems. This area is of particular importance for the analytical novice who may have little or no experience of such systems, which are used throughout industry.

This volume complements and supports traditional instrument based texts and is very accessible to the analytical novice and experienced professional alike. Worked examples and self-assessment questions are provided at the end of each chapter, along with a glossary of terms. With its strong emphasis on analytical strategy and cost effectiveness, it is also recommended to individuals in the practice of laboratory management.

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