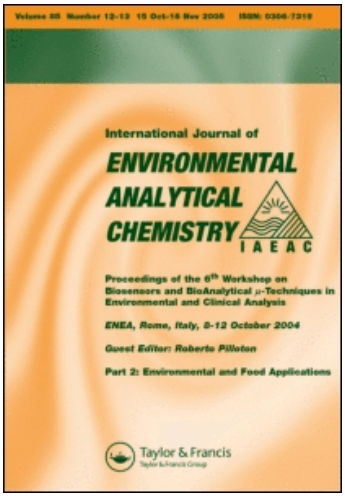

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Book Reviews

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BOOK REVIEWS

AUTOMATIC METHODS OF ANALYSIS by M. Valcárcel and M. D. Luque de Castro, Volume 9 in series Techniques and Instrumentation in Analytical Chemistry, Elsevier Science Publishers, Amsterdam (1988), 560 pages, US$ 131.50

This interesting monograph contains 16 chapters discussing the methods presently in use for automation of laboratory processes in analytical, clinical, and environmental chemistry.

In the first chapter a well-organized review is given on the fundamentals of laboratory automation. Especially the basic objectives of laboratory process automation, the classification of automated analyzers with the possible fields of application, and the advantages and limitations of automatic methods of analysis are discussed extensively.

The second chapter deals with the use of computers in the laboratory and provides information on how to use computers for data acquisition and data processing purposes. In the third chapter a number of examples are given which deal with the automation of solid, liquid, and gas sampling, and with the pitfalls encountered in automated sampling. Chapter 4 deals with the possibility of automating sample pretreatment procedures and describes quite a number of assemblies which can be applied for dissolution, digestion, volatilization, distillation, filtration, sorption, ion-exchange, membrane separation, solid-phase extraction, and liquid–liquid extraction.

Chapters 5–7 discuss automatic continuous flow analyzers. By extensively using schemes, figures, and tables, the theory and applications of, for instance, the advantages and limitations of segmented and non-segmented flow systems, are presented clearly. After the automatic continuous flow analyzers, the automatic batch analyzers (chapter 8) and the robotic systems (chapter 9) are treated. Some characteristic examples of laboratory robotization are given, but no extensive comparison is made between the robotic systems and the continuous flow analyzers.

In the chapters 10–13 the automation of analytical instrumentation is dealt with for spectrophotometric, electroanalytical, chromatographic, and titration techniques. The emphasis in these chapters is mainly on the incorporation of computing systems to control the functioning of the equipment for data acquisition and data treatment, and for using data banks.

Since clinical (chapter 14) and environmental (chapter 15) chemistry are areas in which automation is relatively popular, two chapters are devoted to these research fields. The sections on the stages of clinical analysis, the classification of clinical analyzers, and clinical *in vivo* measurements as well as those on sampling, water analysis, and air sampling are of special interest for the reader.

In the last chapter (chapter 16) the use of process analyzers for monitoring of physical or chemical parameters in industrial process lines is discussed.

In conclusion it can be stated that this monograph will be useful for workers in research and application laboratories in the fields of analytical, clinical and environmental chemistry, and especially for those starting up automated procedures. The considerable number of figures, tables, and schemes has resulted in a well-organized and easily readable book. The only negative points are that some overlap exists between the various chapters and that the number of references is rather limited.

H. LINGEMAN

SELF-DIFFUSION IN ELECTROLYTE SOLUTIONS: A CRITICAL EXAMINATION OF DATA COMPILED FROM THE LITERATURE by R. Mills and V. M. M. Lobo, Volume 36 published in the series Physical Sciences Data, Elsevier, Amsterdam (1988), 354 pages, US$ 134.25

In this monograph an extensive overview is given of the self-diffusion coefficients of both ionic and solvent components in electrolyte solutions. Furthermore, some tables with self-diffusion coefficients of organic species in these solutions, are presented.

The monograph is divided into an introduction in which the more important aspects of self-diffusion processes in electrolytes are discussed, and a short overview of the methods of measurement. In the second chapter a number of explanatory notes have been provided, e.g. on data selection and table layout, and on the use of the over 400 tables in the following chapters.

In the tables, first of all the temperature is listed followed by the pertinent ionic or water species, including the isotopic forms of water, which undergo diffusion. Next, one or more references are given about the data source(s). The table contains a number of columns stating the concentration, the experimental self-diffusion coefficients, and giving "comments", i.e. comparing the data from different sources critically. The tables provide information about binary as well as ternary aqueous electrolyte solutions, mixed solvents, and non-electrolyte species in electrolyte solutions.

The last part of the monograph is devoted to 12 tables with the limiting ionic self-diffusion coefficients for cations and anions at temperatures up to 1000 °C. Finally, a list of references to self-diffusion data which are not included in this monograph, an index of supporting electrolyte solutions, and an index of diffusing species are given.

The monograph is an indispensable handbook for scientists dealing with, for instance, transport processes in aqueous solutions—such as electrochemists—and for scientists involved with the migration of radioactive ions from nuclear waste.

H. LINGEMAN