
BOOK REVIEW

Quantitative Chromatographic Analysis

(Beesley, T. E., Buglio, B., and Scott, R. P. W., eds., Marcel Dekker, N. Y., 2001, 378 p., \$150)

The book is the 85th volume of the well-known *Chromatographic Science Series* and consists of four parts that survey different aspects of quantitative chromatography.

Part I is an introduction to quantitative chromatographic analysis and includes 5 chapters.

Chapters 1 and 2 consider such crucial factors of quantitative chromatographic analysis as the transportation, storage, and preparation of specimens to be studied, the choice of chromatography type, and the analysis of data obtained.

Chapter 3 considers practical methods of chromatography. The chapter analyzes the preliminary purification of specimens from concomitant admixtures, types of extraction, precipitation, dialysis, and also various chemical modifications (esterification, acylation, etc.) and concentration of the specimens. Much attention is paid to discussion of the maximal quantitative yield of the specimens for subsequent chromatography.

Chapter 4 presents characteristics of detectors used in chromatographic analysis. The sensitivity of detectors, their noise levels, the stability of operation, and other important characteristics are discussed.

Chapter 5 considers the specific features in the separation of various compounds during chromatography. The optimal equations are presented which are used on the separation of compounds, their peaks are analyzed, as well as the calculations with the appropriate equations and computerized integration.

Part II of the book is devoted to quantitative analysis in the separation of compounds by gas chromatography (GC). The chapter 6 of Part II considers specific features of gas chromatographs. The modern chromatographs are characterized as highly computerized devices, which include an automated injector of samples, temperature programming, automated regulators of gas delivery, and of the pressure. Operation principles of flame ionization, nitrogen phosphate, and other detectors are described.

The chapter 7 presents examples of the GC use for separation of various compounds: insecticides, mercury-containing ones, phenols, and steroids.

Part III of the book is devoted to quantitative analysis by liquid chromatography (LC).

Chapter 8 considers the use of LC for quantitative analysis. The principles and the equipment of LC are described including different detectors: ultraviolet, fluorescence, electric conductivity, etc.

Chapter 9 considers the use of LC for separation and quantitative analysis of various substances in water, blood, urine, and other biological fluids.

Part IV of the book describes methods of thin-layer chromatography (TLC). Chapter 10 considers the equipment used in TLC, the methods for saturation of the chromatogram chamber with vapors of a solvent, the concentration of the specimens applied, their separation and identification with specific and nonspecific dyes. Variants of scanning densitometry are also characterized in this chapter.

Chapter 11 considers the use of TLC for separation and quantitative analysis of various compounds. Although TLC ranks below LC and GC in quantitative analysis, it is widely used in laboratory practice because of simple equipment and the possibility of fast screening of varied compounds. Examples of the quantitative determination of aflatoxin, phospholipids, and other compounds by TLC are presented. The use of hybrid plates half-covered with silica gel and half-covered with laser desorption matrix is also considered. This combination enables the specimens to be studied by TLC and by mass spectrometry, significantly increasing the sensitivity of the quantitative determination. The use of radioactive labels also allows the sensitivity of the quantitative determination to be increased with scanning counters of radioactivity.

The book is a good guidebook in methods of chromatography and, no doubt, this guidebook will be useful for biochemists, specialists in analytical chemistry and in bioorganic chemistry, and also to those who deal with quantitative analysis of a variety of compounds.

G. Ya. Wiederschain, Ph. D.