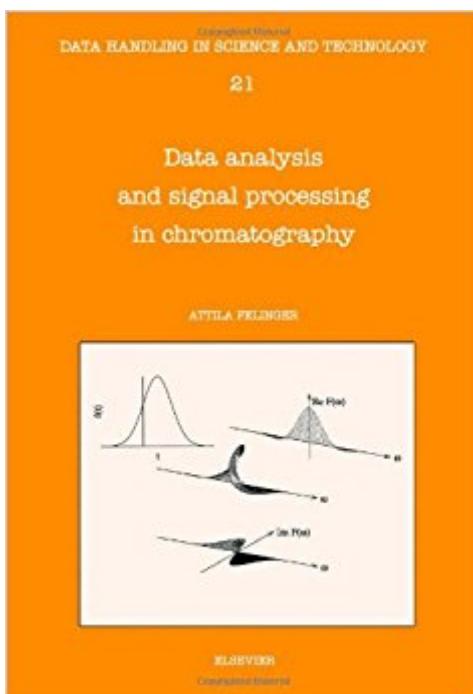


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Data Analysis And Signal Processing In Chromatography, Volume 21 (Data Handling In Science And Technology)



Synopsis

This book gives an overview of the numerical data analysis and signal treatment techniques that are used in chromatography and related separation techniques. Emphasis is given to the description of the symmetrical and asymmetrical chromatographic peak shape models. Both theoretical and empirical models are discussed. The fundamentals of data acquisition, types and effect of baseline noise, and methods of improving the signal-to-noise ratio (either in time or in frequency and wavelet domain) are thoroughly discussed. Resolution enhancement techniques, such as curve fitting, deconvolution by Fourier and wavelet transforms, iterative deconvolution, Kalman filtering and multivariate methods of curve resolution are all discussed with several chromatographic examples. Quantitative analysis by peak area or peak height measurement, the precision and accuracy of the quantitation of stand-alone or overlapping and symmetrical or asymmetrical peaks are treated. In a separate chapter, guidelines are given for the use of transform techniques for the analysis of chromatograms. A statistical description of peak overlap is given in the final chapters. Since the concept of resolution has to be reconsidered when one separates complex mixtures, the problem of resolution and overlap is quantitatively discussed by means of statistical methods, and by using Fourier analysis of the complex chromatogram. Features of this book: The ultimate source of numerical techniques to enhance chromatographic data: Gives a detailed description of signal and resolution enhancement techniques in a manner applicable for enhancing not only chromatography, but also spectroscopic and other analytical signals: The first book with a thorough overview of the statistics of peak overlap. This is the first volume to encompass both the simple and more sophisticated methods for the numerical treatment of chromatograms. It is, therefore, the fundamental resource of numerical analysis methods for every analyst.

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