

Preface

This book answers two basic questions regarding high-performance liquid chromatography; it focuses on how compounds can be separated and on why particular compounds are separated by liquid chromatographic methods. It consists of six chapters: Basic Concepts of HPLC; Instrumentation: Preparation, Testing and Selectivity of Stationary Phase Materials; Selection of the Eluent; Separation Based on an Improved Column Efficiency; Influence of Physical Chemistry on Separations in Liquid Chromatography. The focus is on the basic considerations in liquid chromatography rather than the applications but there are also sections on trouble-shooting. The book is concerned mainly with the selection of a packing material and the preparation of the eluent. Theoretical optimization is demonstrated using the chromatography of simple chemicals, to aid the understanding of liquid chromatography by graduate students. The examples given go beyond what can be found in general textbooks on liquid chromatography. The separations can be easily understood from the differences in properties of familiar compounds known to undergraduate students.

The chromatographic separations described are based on solubility using molecular properties. The selection of chromatographic mode and column is analysed using solubility parameters. The separation factor α is described in detail by physical and chemical parameters. Discussion of instrumentation focuses on high-efficiency operation and is concerned with degassing, the time constant, flow cell design, connectors and trouble-shooting. Packing materials and their synthesis and surface modification, liquid chromatographic analysis of surface activity and the evaluation of packed columns, including the measurement of void volume, are also considered.

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