

Book Reviews

Practical High Performance Liquid Chromatography, 3rd ed.

Veronika R. Meyer; Wiley, New York, 1998, xiii + 338 pages, hardback, ISBN 0-471-98372-1, £90.00, paperback, ISBN 0-471-98373-X, £50.00

High-performance liquid chromatography (HPLC), is one of the most important separation methods and analytical techniques available. HPLC is very efficient, yielding excellent separations rapidly, it is a powerful separation method able to resolve mixtures with large numbers of similar analytes.

Practical High Performance Liquid Chromatography, 3rd ed., provides a unified approach to HPLC, with both the theoretical and practical aspects of the subject treated equally. The text deals with separations where the particle diameter of the stationary phase does not exceed 10 μm , and where the column is well packed giving a plate weight of less than five. The major HPLC methods: reverse-phase; ion exchange; ion-pair; adsorption; size-exclusion; and affinity are well described with practical method development procedures and a variety of applications. More advanced analysis is also considered: chiral chromatography; supercritical mobile phase; micro and capillary and electrochromatography.

This well illustrated and easily readable volume shows many possibilities and problems associated with HPLC. The chapters have been revised considerably, and one chapter covering the pump has been completely rewritten, covering the general requirements, details of the short-stroke piston pump, maintenance, repair and other pump designs. A synopsis of the most important formulas is included, along with chapters on solvent properties, instrument tests and troubleshooting.

This book is a classic HPLC text, appropriate for undergraduate and postgraduate students using HPLC and those professionals undertaking HPLC analysis. It features updated references and figures on instrumentation, as well as numerous other improvements.

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The Elements of Polymer Science and Engineering, 2nd ed.

A. Rudin; Academic Press, San Diego, 1999, xvii + 509 pages, ISBN 0-12-601685-2, US\$65.00

Synthetic polymer research and technology is an extremely active scientific field due to the commercial importance of such materials. *The Elements of Polymer Science and Engineering, 2nd ed.* is intended as an introductory text, and is also useful as a self-instruction guide for engineers and scientists without formal training in the subject who find themselves working with synthetic polymers. The material presented in this volume, therefore, begins with basic concepts, the opening chapter covering introductory concepts and definitions, e.g. degree of polymerisation, copolymers, molecular architecture, thermoplastics, elastomers, nomenclature, etc.

The mechanical properties and processing behaviour of polymers depends upon their average size and distribution of sizes of macromolecules. Chapter 2 of this volume, therefore, deals with the basic principles of polymer molecular weights, whilst chapter 3 covers practical aspects of molecular weight measurements, focusing upon the fundamentals of molecular weight statistics and the measurement of molecular weight averages. Light scattering, dilute solution viscometry, and size exclusion chromatography, are discussed in specific sub-sections. The fourth chapter outlines the effects of polymer isomerism and conformational changes, covering constitutional isomerism, configurational isomerism, polymer conformation, amorphous molecular dimensions, and rubber elasticity.

The following five chapters deal with different types of polymerisation, namely step-growth polymerisations, free-radical polymerisation, copolymerisation, dispersion and emulsion polymerisation, and ionic and co-ordinated polymerisations, respectively. Chapter 10 introduces polymerisation reaction engineering, and aims to demonstrate how basic concepts are applied in practice. The penultimate chapter discusses the basic elements of the mechanical properties of polymeric solids and liquids (melts). Topics such as viscoelasticity, dynamic mechanical behaviour, fracture mechanics and rheology are discussed because of their importance to polymer applications. Polymer mixtures are of great commercial importance and are covered in the final chapter. Compatibility, solvents, plasticisers, reinforced elastomers, and reinforced plastics are discussed.

Obviously, it is impossible for a volume of this size to be