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Journal of Pharmaceutical and Biomedical Analysis
17 (1998) 915

JOURNAL OF
PHARMACEUTICAL
AND BIOMEDICAL
ANALYSIS

Book review

The HPLC Solvent Guide, by Paul C. Sadek, John Wiley and Sons, Inc., London, 346 pages, $54.95, ISBN: 0-471-11855-9

When first contemplating development of a new HPLC method, the first concern usually relates to the choice of column to be used for the separation. Many workers assume that the mobile phase will consist of water (or an aqueous buffer), methanol, or acetonitrile. In this volume, the author has chosen to focus on the question of solvent selection, and has produced a detailed guide of solvent properties that specifically pertain to the topic of HPLC methodology. By taking the bounds of solvent coverage beyond the big three just mentioned, he offers analysts insight into the use of alternate solvents.

The first chapter contains a general description of the physical and chemical properties which are of import to the choice of an HPLC solvent. The topics covered in this chapter are UV cutoff, absorption spectra, reversed-phase solvents, normal-phase solvents, viscosity, miscibility and solubility, volatility, solvent instability and reactivity, inherent contaminants, solvent effects on fluorescence, particulates in solvents, solvent strength parameters, and solvent selectivity. The section on eluotropic series and solvent parameters is particular well-written (and concise as well), and provides an excellent insight into the systematic choosing of solvent systems for separation purposes based on their thermodynamic properties.

Solvents appropriate for use in HPLC methods are then divided into seven groups: alcohols, alkanes and alkyl aromatics, chlorinated alkanes and chlorinated benzenes, ethers, ketones and esters, nitriles and nitrogenous solvents. The final division covers water, dimethyl sulfoxide, and common acidic modifiers. Each chapter begins with a description of the general characteristics of the solvent type, and includes information on typical impurities. The author then provides numerous examples where members of a given solvent system have been used for the development of a HPLC method. The analyses covered in this manner are general analytes, environmentally important analytes, industrial and polymer analytes, biological analytes, amino acid, peptide, and protein analytes, and pharmaceutical analytes. This diverse approach serves to ensure that the needs of an extremely wide variety of HPLC analysts are covered through the illustrative examples, for which there are 1123 cited references.

Without a doubt, this book belongs on the shelf of every practicing HPLC scientist. The exhaustive and systematic coverage of HPLC mobile phases should provide pathways for analytical separations that might not occur to the vast majority, and which could conceivably shorten the time required for method development. Certainly, the myriad of approaches taken by the cited investigators should suggest parallel approaches for future work. It is probably true that this volume represents the most detailed and comprehensive treatment of HPLC solvents in print, and is a vital resource to anyone who might ever have to develop a HPLC method.

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PII S0731-7085(98)00007-7