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A review of: "RETENTION AND SELECTIVITY IN LIQUID CHROMATOGRAPHY"

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BOOK REVIEW

RETENTION AND SELECTIVITY IN LIQUID CHROMATOGRAPHY

R.M. Smith, Ed.

Elsevier, Amsterdam, 1995; hardbound,
pp. xv+457, $245.75

The twelve chapters of this work (volume 57 of the "Journal of Chromatography Library" treat: 1. Retention prediction based on molecular structure, by R.M. Smith; 2. Retention prediction of pharmaceutical compounds, by K. Valkó; 3. Retention index scales used in high-performance liquid chromatography, by R.M. Smith; 4. Application of retention indices for identification in high performance liquid chromatography, by R.M. Smith; 5. Application of nitroalkanes and secondary retention index standards for the identification of drugs, by M. Bogusz; 6. Identification using retention indices in gradient HPLC, by P. Kuronen; 7. Characterization of retention and selectivity in reversed-phased LC using interaction indices, by P. Jandera; 8. Lipophilic and polar indices, by P. Jandera; 9. Solvent selectivity, by S.D. West; 10. Retention and selectivity for polycyclic aromatic hydrocarbons in reversed-phase liquid chromatography, by L.C. Sander and S.A. Wise; 11. Comparison of novel stationary phases, by J.J. Pesek and E.J. Williamsen; and 12. Multivariate characterization of RP-HPLC stationary phases, by A. Bolck and A.K. Smilde.

The brunt of this work consists of attempts to correlate functional group properties with retention indices; see, e.g., chapters 1, 3 and 4 by the Editor; see also chapter 7. Jandera (chapter 8) brings these efforts somewhat closer to the incorporation of primary physical interaction properties of solutes (and solvents) by introducing "lipophilic" and polar indices, which however are still more empirical than fundamental entities (see also Horváth et al.'s solvophobic theory[1]). One of the factors that still prevents ab initio prediction of chromatographic retention based on primary measurable physico-chemical properties of solute as well as of solvent molecules, is the usually still incomplete understanding of hydrophobic (or solvophobic) and other polar interaction forces[2].

However, the use of empirical parameters can often furnish indices of good to excellent predictive value, as witnesses this work, which is recommended to all who are involved or interested in the more theoretical aspects of chromatography (gas chromatography as well as reversed-phase HPLC).

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References:

1. C.S. Horváth, W. Melander and I. Molnár, J. Chromatog. 235, 31 (1982).
2. C.J. van Oss, Colloids Surfaces A, 78, 1 (1993); Interfacial Forces in Aqueous Media, Marcel Dekker, New York, 1994.