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Journal of Chromatography A, 775 (1997) 379–380

JOURNAL OF
CHROMATOGRAPHY A

Book review

High-speed Counter Current Chromatography (Chemical Analysis: A Series of Monographs on Analytical Chemistry and Its Applications, Vol. 132), edited by Y. Ito and W.D. Conway; Wiley, New York, 1995, ISBN 0-471-63749-1; xxiv+454 pp., price £60.00.

The book is edited by two counter current chromatography (CCC) pioneers, Yoichiro Ito, who invented the technique, and Walter D. Conway.

Both already published a monograph on CCC; Ito in 1988 [1] (with N.B. Mandava as co-editor) and Conway in 1989 [2]. They joined their expertise in the field to achieve a new book offering a synthetic point of view on CCC and giving a review of its latest applications and developments.

The book is divided in three parts: 'Instrumentation', 'Special techniques' and 'Applications'.

The first part includes two chapters devoted to principle, apparatus methodology of high-speed (HS) CCC (Ito) and to analytical HSCCC (Schaufelberger).

In the first chapter all aspects of the instrumentation are well described. To simplify the data presented for unexperienced readers, some parts devoted to unused motions of the columns could perhaps have been omitted. In the part on detection, fluorescence detection is not cited though it can be very efficient in CCC.

The second chapter deals with analytical HSCCC and the author shows honestly that the main interest of analytical HSCCC is method development for larger scale application because CCC cannot compete with HPLC from the point of view of speed of analysis. The chapter is well written. However, there is something wrong in equation 2-13. The term

(1-SF)/SF should be in the denominator and (as in [2]) N should appear as its square root. This expression should be attributed to Purnell instead of Knox (as in [2]).

The second part is devoted to special techniques. The more interesting chapters in this section are chapter 6 (Ito) devoted to pH focusing techniques developed recently and chapter 3 on HSCCC-MS (Oka) despite all data cited in this chapter were published prior to 1993.

Chapters 4 and 5 devoted to dual mode CCC and to foam CCC contain information known to CCC users and the data presented were published before 1990. They can be of interest for new comers in the field.

pH focusing techniques in CCC have a great potential for purification of compounds; it deserves an important part in the book because it allows high sample input and it leads to very high purity fractions with minimum overlapping as described in this section. However, I am not convinced CCC is very relevant to separation of enantiomers because simulated moving bed is, when only two components are involved and further separation of enantiomers from the stereoselective additive added in the solvent system is required: this can lead, to some extent, to racemisation of the purified enantiomer. This is not the case in HPLC using chiral stationary phases.

The last section is entirely devoted to applications. Most of the chapters deal with natural products because, obviously, this is the main interest of the technique and the examples described in this section deserve publication. However, only a few are well detailed concerning solvent optimization (chapter 10 by Harada) and some could have been gathered in different chapters because they deal with similar

compounds or could have been simplified because too much details are given not directly related with CCC or because too much examples of very similar compounds are described in the same chapter (in chapter 12 for example).

Again, it is important that pH focusing techniques appear in this section (chapter 12).

Two interesting chapters are devoted to separations of proteins (Shibuzawa) (I regret no simple explanation of the separation mechanism appears) and on separation of inorganic elements (Kitazume). Thus, this section gives a good overview of CCC applications but lacks some organization. Again, it is disappointing to see most of the references appearing have been published before 1992.

To conclude, this book is a good introduction to CCC techniques because the main techniques are well described with relevant applications. A large

part is devoted to pH focusing techniques which did not appear in previous monographs.

Considering the points mentioned in this discussion, I recommend the book mainly to newcomers to the field who want to have a good and simple overview of this very exciting technique.

Paris, France

D. Thiébaud

References

- [1] N.B. Mandara and Y. Ito (Editors), Counter current Chromatography – Theory and Practice (Chromatographic Science Series, Vol. 44), Marcel Dekker, New York, 1988.
- [2] W.D. Conway, Counter current Chromatography – Apparatus, Theory and Applications, VCH, New York, 1989.