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## Book review

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*Tandem Techniques*, by R.P.W. Scott [Wiley Separation Science Series, R.P.W. Scott, C.F. Simpson, D.E. Katz (Eds.)]. Publisher: John Wiley and Sons, Chichester, New York, Weinheim, 1997. ISBN 0-471-96760-2; xii+526 pp; £50.00

Tandem techniques, defined as the combination of a “separating device with the identifying spectrometer”, are an increasingly important feature of modern analytical laboratories. This book, by a single author, is an attempt to provide an introduction to the burgeoning field of tandem techniques (more commonly referred to as “hyphenated techniques”). The author has a justified reputation in the field of chromatography and chromatographic detectors and is also one of the editors of the Separation Science Series. Even so, reviewing such a broad topic is an ambitious undertaking for a single person, given the very rapid pace of advances in the area. For example, the spectacular advances in HPLC–MS in the last few years have radically altered the way in which drugs in blood or plasma are analysed and have already led to a large number of applications.

The volume is divided into four parts. The first section comprises approximately 130 pages devoted to a general description of the various separation methods and spectroscopic techniques that can be coupled together to form tandem systems and also some of the interfaces required to do this. The separation techniques discussed include GC, HPLC, TLC and CE while the identification techniques cover UV/Vis, IR, Raman, chiroptical, atomic and NMR spectroscopy together with a range of mass spectroscopic techniques. These are competently described and I would have no hesitation in recommending this section to a colleague seeking an

introduction to these topics although I was surprised at the absence of any discussion on SFC.

Part 2 (119 pages) describes tandem systems in GC, i.e. GC–MS, GC–IR, GC–IR–MS and GC–AES. In general I found these chapters informative and they covered the areas reasonably well. In Part 3 (179 pages) the coupling of LC to UV, fluorescence, IR, atomic spectroscopy, mass spectroscopy and NMR are discussed. In the case of LC–MS nothing seems to become obsolete faster than interfaces and the coverage of this topic did seem a little dated. In particular the discussion of the moving belt interface is probably only of historic interest. Even relatively new ionisation techniques such as thermospray have been eclipsed by electrospray, atmospheric pressure ionisation and atmospheric pressure chemical ionisation. These modern methods could have received more coverage at the expense of older methods.

I found more to disagree with in the short section on HPLC–NMR, particularly the contention that “NMR is the most difficult technique to operate on-line with a liquid chromatograph” and the “modern LC–NMR systems are largely off-line devices” as that does not square with my own experience. There seems to be a concentration on problems that have been solved, such as obtaining magnetic field homogeneity and good solvent suppression. However, this is a field in which the pace of development is so rapid that any review will be out of date as soon as it is finished! Also much depends upon the scientific application.

In Part 4 (60 pages) tandem systems with TLC and CE are considered. The section on TLC is poor, the coverage restricted and unrepresentative. There are good reviews of this area, for example the up-to-date and excellent review of TLC–MS by Busch in

Sherma and Fried's Handbook on Thin Layer Chromatography. The present volume would have been improved by the omission of this chapter.

In going through the book I noticed a number of minor mistakes such as incorrectly numbered references, incomplete references and spelling mistakes suggesting a certain degree of laxity on the part of the publisher. It was also interesting to note the very restricted range of journals cited (mainly *Anal. Chem.* and the *Analyst*). These journals are im-

portant but many of the most interesting applications are to be found elsewhere.

Overall this is a book which, like the Curate's Egg, is good in parts. Clearly the topic of tandem techniques is now so extensive as to be beyond the capabilities of a single author, no matter how widely read.

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