

## Book Reviews

**Handbook of Batch Process Design.** Edited by P. N. Sharratt. Blackie/Chapman and Hall: London, UK. 1997. 320 pp. ISBN 0 7514 0369 5. £75.

Batch processes are used widely throughout the fine chemical industry yet have attracted a limited literature. This gap is filled by this multi-author work, which covers topics such as scheduling and simulation, use of solvents, agitation, mixing and selectivity of fast chemical reactions, batch filtration, design, control hazards, environmental protection, and future developments. Each chapter is written by a recognised expert in the field, and the approach to each of the topics is from that expert's own standpoint, so there is little integration between chapters. I particularly enjoyed the sections on agitation by K. Carpenter (Zeneca), mixing and selectivity by J. Bourne (ex ETH), and batch filtration by A. Rushton (UMIST) whereas the chapter on solvents was the least rewarding. For example, a table listing important organic solvents on page 67 includes CS<sub>2</sub>, pyridine, CCl<sub>4</sub>, and nitrobenzene but omits 2-propanol, hydrocarbons such as hexane, heptane, and toluene, and dichloromethane. The emphasis in this section was more theoretical than practical, with solvent extraction being treated in only a single page. No mention was made of optimising extraction (volume of solvent, number of extractions, choice of temperature) or that byproducts often arise during extractions by hydrolysis or reactions with solvent in large-scale operations.

The chapter on Environmental Protection and Waste Minimisation (C. Jones, Fluor Daniel) was short (18 pages) but contained useful tables which relate to optimisation and process improvement as a key aspect of waste minimisation, a philosophy which I agree with, but which is not always given enough prominence. Thus, checklists for crystalliser optimisation, opportunities for waste minimisation, process optimisation during filtration centrifugation and washing, and opportunities for improving the efficiency of driers are full of very practical advice.

The editor has written an introductory chapter (Chemicals manufacture by batch processes) and the final chapter on new developments, where he briefly mentions microwave drying, membrane technology "power fluidics", process-scale chromatography, and process intensification. He also identifies new skill requirements for both chemists and chemical engineers and suggests that new forms of technological training should be considered.

In conclusion, this is a welcome addition to the limited number of books devoted to chemical technology and is a readable account which is recommended to chemists and chemical engineers alike.

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**Handbook of Phase Transfer Catalysis.** By Y. Sasson and R. Neumann. Blackie/Chapman and Hall: London, UK, 1997. 576 pp. £125. ISBN 0 7514 0258 3.

Phase transfer catalysis, despite being classed as a mature discipline, continues to attract academic and industrial attention (e.g., recent publications in asymmetric PTC highlighted in OPRD) so it is no surprise that a new book on the subject has appeared. Sasson and Neumann's book will inevitably be compared with the classic work of Starks, Liotta, and Halpern (Chapman and Hall, 1994) and the 1993 Dehmlow book (Verlag). The editors have assembled a multinational group of well-known chemists mostly from the academic world to write individual chapters. The coverage is similar to the Starks, Liotta, and Halpern book but, being a multi-author work, is less even. However, some of the chapters are very detailed (e.g., 74 pages on kinetic modeling), and there are some novel chapters on "PTC in carbohydrate chemistry" and "sonochemical and microwave activation in PTC".

Inevitably, one will be asked whether it is worth buying this volume if one already has the Starks book. Well, three years of additional examples plus a different viewpoint from renowned chapter authors such as Professor Makosza (Polish Academy of Sciences) make this a worthwhile purchase.

Industrial chemists will gain a great deal of understanding of PTC processes and comprehensive references to academic and patent literature to 1996, so this is a welcome addition to the process chemist's library.

**T. Laird**

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