

## Book Reviews \*

**BP Process Safety Series. IChemE: Rugby, 2004.** (A) Hazards of Water. £15. ISBN 0-85295-466-2. (B) Hazards of Steam. £15. ISBN 0-85295-468-9. (C) Hazards of Air and Oxygen. £15. ISBN 0-85295-467-0. (D) Hazards of Nitrogen and Catalyst Handling. £15. ISBN 0-85295-469-7.

These short booklets of 40–65 pages each have the same introductory statement: “It should not be necessary for each generation to rediscover principles of process safety which the generation before discovered. We must learn from the experience of others rather than learn the hard way. We must pass on to the next generation a record of what we have learned”. This quotation by Jesse Ducommun who was then Vice President of the American Oil Company was made in 1961. It is still true today. Each booklet gives expert guidance and many case studies of accidents which help the reader to understand the hazards. The booklets are beautifully produced in colour and ideal for safety training sessions even though most case studies are, as expected, from the petroleum industry. The style reminds me of some of Trevor Kletz’s publications and is ideal for those working in plant situations. Highly recommended! More titles are to be produced in coming years, so a full set should be in every library.

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**Protecting Groups, 3rd edition.** By P. J. Kocięński. Georg Thieme: Stuttgart. 2005. 679 pp. \$89.95/EUR 69.95. ISBN 3-13-135603-0 (paperback).

The paperback edition of the 3rd edition of Kocięński’s “Protection Groups” has now appeared. It is beautifully written and produced and represents fantastic value for the money.

The author has completely rewritten and updated the earlier volumes, dating from 1994 and 2000, adding new chapters, too. The number of schemes has increased from 500 to 1200, and references, from 1200 to 2270. I like the way he begins the references with lists of review articles on various topics.

Professor Kocięński, now back at the University of Leeds, has a pleasing style of writing. He compares protecting groups to death and taxes; we do not like them but cannot avoid them. For the industrial chemist, and particularly the process chemist, incorporating a protection group in the

synthetic scheme adds two steps with the inevitable reduction in yield and increase in cost. They add no value to a synthesis, but the synthesis of a complex molecule can seldom avoid their assistance. In the opening chapter, the author discusses protection groups by focussing on the deprotection step, since it is the timing, sequence, and conditions of deprotection which govern the strategy. He divides protection groups into orthogonal sets, based on the conditions of deprotection (base, acid, heavy metals, fluoride, reductive elimination,  $\beta$ -elimination, hydrogenolysis, oxidation, dissolving metal reduction, nucleophilic substitution, transition metal catalysis, light, and enzymes).

The main chapters cover protection groups for carbonyl, diol, hydroxy, thiol, carboxyl, phosphate, and amino groups. The final chapter is a set of 25 problems of varying difficulty. The largest chapters, as expected, are on protection of hydroxy (177 pp) and amino (156 pp) groups. For example, the comprehensive review of hydroxy group protection includes silyl ethers, alkyl ethers, alkoxymethyl ethers, THP and related ethers, esters, and carbonates. Each group is then broken down further so that for silyl ethers, the deprotection and formation of TMS, TES, TBS, TBDPS, TIPS, DEIPS, TDS, TPS, and DTBMS ethers is discussed in detail. In the introduction to this section, the relative merits of each group are compared, and the relative kinetics of cleavage under both acidic and basic conditions are given. The emphasis in the discussion is on practicality, and on many occasions the precise work-up needed to remove byproducts, arising from the protection strategy, is delineated.

A key feature is the number of examples chosen to illustrate how each protecting group has been used in synthesis—the examples are mostly from natural product synthesis with the occasional industrial example. The highlights of the synthetic strategy are discussed in a concise yet very readable manner, along with well laid-out schemes, using colour to highlight the protecting groups.

The book is a joy to read yet is essentially a reference book too, assisted by its clear organisation and useful index. It is by far the best book on protection groups but is different from the other important book, by Greene and Wuts, on the same subject. You need both books, but with Kocięński’s book, now in paperback at a lower price, it can and should be on every chemist’s bookshelf as well as in the library. Highly recommended!

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\*Unsigned book reviews are by the Editor.