the reader are very well undertaken. The strength of this series has been to provide clear and practical examples, with diagrams and photographs where required. This has continued, and has been improved, in this edition. There are a large number of useful and relevant worked examples throughout the text. In addition, dozens of additional problems are available at the end of the book, with Volume 4 containing the solutions, thus allowing for deeper student practice.

Coulson and Richardson's Volume 1, 6th edition, should continue, in future, to not only be an invaluable tool for the undergraduate chemical engineers and scientists, but also useful for chemical engineering teachers, and those in industry who wish to brush up on fundamental principles.

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Surfactants: Fundamentals and Applications in the Petroleum Industry

Cambridge University Press, 2000, pp. 621, £85.00 (US$ 140.00) (hardback), ISBN 0-521-64067-9

This book has the potential to be a useful reference book for researchers in the petroleum industry in the future. As it is presently written, however, the book needs heavy editing because it is verbose and important technical learning points are many times hard to extract. The book is an amalgam of well-demonstrated facts with speculations and it is sometimes difficult to distinguish between them.

Also, there are flaws in its technical content. For example the book omits to mention that emulsion aging affects demulsification treatment. Perhaps more seriously, it also lacks a thought-provoking discussion of the surfactant-screening techniques that were developed for low-tension processes and which are currently being used in bio-remediation studies.

During the past 28 years, I have screened surfactants for many household (cosmetics, detergents, etc) and oil-field applications (low-tension processes, foams, etc.). So far, I have found that a practical way of screening surfactants is by conducting either salinity scans or oil scans [1]. Salinity and oil scans can be tailored by creative researchers to quickly learn about physicochemical behavior of the surfactants being considered. In addition, salinity and oil scans are excellent as quality control tools for surfactant manufacturing. These phase behavior techniques are well described by Shah and Schechter [2].

Since the equivalent carbon number (EACN) concept, mentioned, by Schramm, in Chapter 2, was developed by conducting oil scans and surfactant selection on Chapter 11 was developed according to salinity scans, I suggest that Schramm's book should also contain a chapter somewhat similar to that on phase behavior techniques in Shah and Schechter's book.

In view of the serious reservations I have expressed above, I would hesitate to recommend purchasing this book in its present form.

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Molecular Modelling Applications in Crystallisation

Allan S. Myerson (Ed.); Cambridge University Press, 1999, 354 pp., £70 (US $110) (hardback), ISBN: 0-521-55297-4

This book provides a view of the current state of applications of computer modelling to crystallisation. It includes chapters on computer modelling and the basics of crystallisation, followed by a series of case studies of modelling applications.

The first chapter, An Introduction to Molecular Modelling, includes a detailed account of statistical mechanics and its relation to thermodynamics, before proceeding to intermolecular forces, potential functions and the techniques of Monte Carlo, molecular mechanics and molecular dynamics. The treatment is detailed and rigorous, but this may be a potential deterrent to someone just wanting to get a feel for the techniques available. At the same time the chapter has two significant omissions — it neglects to explain how electrostatic interactions are computed (of significance when modelling ionic materials), and it does not describe the techniques based on lattice energy minimisation which are widely used in the simulation of crystal structures and morphology. I will return to these points later when considering applications.

The chapter on crystallisation basics provides a useful summary of crystallographic concepts (structures, space

groups, and bonding), before considering crystallisation itself.

Moving on to applications, the first case study chapter concentrates on molecular crystal systems. It is concerned with lattice energy calculations for these materials, and their use in crystal structure prediction. The prediction of crystal morphology using attachment energies is then described, but no mention is made of the alternative approach that uses surface energies. The chapter includes a useful section on the combination of Rietveld methods with theoretical approaches in the refinement of X-ray powder diffraction data. A chapter concerned with understanding nucleation, growth and habit of crystals follows this. However, the examples given are all molecular crystals and the techniques used are those covered in the previous chapter. While the work described is interesting, the inclusion of this chapter as well as chapter three does suggest a bias towards molecular crystals in the book as a whole.

The chapter on ionic crystals describes the use of the Hartman-Perdok PBC model to ADP and related structures, and to ammonium chloride. The theory is described in great detail, and anyone wishing to read a comprehensive description will find it here. However, the current usefulness of this approach in modelling inorganic materials must be questioned in view of the development of atomistic potential based simulation methods for the calculation of inorganic crystal structures, properties and morphologies [1,2].

The final chapter is concerned with the structure of organic chiral pharmaceuticals, and the extent that molecular modelling has been successful. It builds on chapter three, but is not concerned with crystallisation specifically.

In summary, this book describes some applications of molecular modelling to the understanding of crystallisation in a range of materials. There is an undoubted bias towards organic/molecular materials, and unfortunate omissions in the treatment of inorganic materials. This omission is notable in the theory chapter, which ignores electrostatic interactions. It is a pity that the currently available simulation techniques for inorganic materials have not been included in a book which is likely to be read by those seeking to know the current state of the subject. It might be useful for those whose main interest lies in molecular materials. However, it cannot be regarded as a general text on applications of molecular modelling in crystallisation, as suggested by the title.

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By Accident . . . a Life Preventing Them in Industry
Trevor Kletz, PFV Publications, 2000, 144 pp., £14.95 (paperback), ISBN: 0-9538440-0-5

To judge by the decline in applicants for engineering places at UK universities, there should be more books like this. One of the author's aims is to show potential students "that life in industry is useful, satisfying and enjoyable". I feel he comes closer to his aims in this respect than in "conveying the excitement of the time".

Dr. Kletz played an important role in the development of loss prevention, as we know it. The graph, illustrating the steady fall in the fatal accident rate during his 14 years as Technical Safety Advisor within ICI, is a clear demonstration of the usefulness of his work. On the other hand, he is less successful in transmitting the enthusiasm he must have felt and the reference in the publisher's press release to Kletz' "inimitable prose" is, perhaps, an apt description.

This autobiography falls into three parts: his early years with ICI from 1944 to 1968, the following 14 years as Technical Safety Advisor, and his work as a consultant and part-time academic at the University of Loughborough, following his retirement from ICI in 1982. Interestingly, only a single chapter covers this last, but longest and most prolific in terms of publications and lectures, part of his career. This last chapter also contains useful summaries of his previous nine books.

After a brief description of his early schooldays, his family background, and his university days, further references to his life "away from work" are restricted to three short sections distributed through the book. This may have something to do with the suggestion that:

> 'Men or women who go to the extreme length of marrying scientists should be clearly aware beforehand . . . that their spouses are in the grip of a powerful obsession that is likely to take first place in their lives' [1] (one of the apt quotations with which the book is peppered).

He then describes the various positions he held in research, in the technical department, and in operations before becoming Assistant Works Manager in 1961. In 1968, he had the "luxury of writing his own job description" as ICI's first Technical Safety Officer. He provides a fascinating insight into the workings and attitudes within ICI in an era when industry in general was much more people oriented