than I believe it is now. He became a master at management by persuasion and the book includes a number of useful tips as to how this may be done. He uses summaries of several case studies to illustrate points in the book and gives references to the more detailed descriptions to be found in his earlier publications.

Throughout the book he makes the point that ICI staff had (could take) considerable freedom of action, and this clearly had a major influence on the impact he was able to have on safety, both within ICI and outside. It is unfortunate that he takes a swipe at an oil company (which, like the author, I also shell not name!) "where everything seemed to be referred to HQ", as my recollections of that oil company are similar to his of ICI with respect to independence of action.

The book is illustrated with some amusing cartoons and a number of monochrome photographs of plant, colleagues and family. More cross-referencing between the illustrations and the text would be helpful, particularly since most of the pictures are in two groups, some way from the relevant text. More comprehensive captions would also help.

Despite the reservations I have expressed above, I enjoyed the book and suggest that it should be read by anyone interested in the development of loss prevention (as an example of innovation?) and in the workings of ICI during the 60s and 70s. I imagine that anyone who knows (of) Trevor Kletz is also likely to buy the book. I hope that they will then pass it on to some of the young people who the author (and the rest of us) would like to attract to the profession. If the cover looked a bit less like a Tory election poster they might even buy it for themselves!

As Sir John Harvey Jones says in his introduction to the book, "Trevor Kletz will, I am sure, always sleep soundly at night ...."

Reference

[1] Sir Peter Medawar, Advice to a Young Scientist, Pan Books, London, 1981.

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Electrophysical Phenomena in the Tribology of Polymers
A. Sviridenok, A. Klimovich and V. Kestelman, Gordon and Breach Science Publishers, 192 pp., US$ 75.00 (hardback), ISBN 90-5699-577-4

This book is a part of the important and timely series on Polymer Science and Engineering, in which Gordon and Breach Science Publishers introduce the latest scientific and engineering achievements by the polymer scientists of the former Soviet Union to the English-speaking engineering community.

In the field of tribology, dealing with the complicated multi-facetted phenomena of friction and wear, some of the most exciting and still far not understood are triboelectric processes. A multi-component friction force, resisting a relative motion of contacting surfaces, is a result of a number of inter-related deformative, adhesive, cohesive, abrasive, chemical, physical and other processes. Among them are contact emission of electrons, photons and X-rays, emergence of the electret state, static electrification and electrostatic discharge, studied by so-called triboelectrophysics.

Though triboelectrification has been observed for many materials, it plays an especially visible role in the friction of polymers. Polymers are highly sensitive to the triboelectric phenomena. Tribology of polymers has recently evolved from pure tribomechanics, which studied plastic and elastic deformations of contacting solids, to a multi-disciplinary science, incorporating the knowledge of physical, chemical and electrical tribo-processes.

In the good traditions of Russian tribology, this book includes both theoretical considerations of triboelectrophysics and relevant experimental data, with descriptions of the experimental apparatus. While the experimental part of the book is quite detailed and practical, the theoretical one has not been developed up to the level of comprehensive mathematical models, due to the lack of precise knowledge of the physics of triboelectrification.

Quite useful are the chapters covering triboelectrification of polymer powders, block and molten polymer materials separately. The triboelectret state of polymers, polymer composites and coatings are described extensively. In addition to studying the triboelectric phenomenon at dry friction and vacuum, the book includes some interesting data on triboelectrification at various humidity levels and fluid friction.

This rich scientific material is shown to have very important practical applications in such different processes as wear in bearings, cutting diamond crystals, sand-blasting, grinding, deposition of polymer coatings, extrusion of polymer fibers, electron-ion formation of durable polymer composite materials, various types of tribodiagnostics, and condition monitoring.

Each chapter includes a large number of references, some of them unknown in the West. Only a few Japanese and American sources have been missed.

The only drawback is that the book was written in Russian and then translated; as a result, the reading is not always smooth and easy, some terms are not always the most common for the Western reader.

Overall, this is a singularly deep insight into the vastly underappreciated electrophysical phenomena of friction. I strongly recommend it for scientists, engineers and

graduate students, working with and studying polymers and even non-polymer tribological problems, as an excellent introduction into the electrophysical effects in friction and as a rare summary of quality studies of this phenomenon.

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Nucleation Theory: Basic Theory and Applications
Dimo Kashchiev, Butterworth Heinemann, 529 pp., £75.00, hardback, ISBN 0-7506-4682-9

It is a long time since a book appeared on the topic of nucleation, and the field was in considerable need of one. Experimental and theoretical understanding of the nucleation of phase transitions has developed rapidly in the last decade, and while progress has been described in a number of review articles, nothing more ambitious has appeared. Dimo Kashchiev has now provided a volume describing some developments in the theory of nucleation, and how it can be applied to various common processes. These include the homogeneous and heterogeneous formation of new phases in two and three dimensions, and the book deals with droplet formation from vapours, solid phases from melts and solutions, and bubbles from liquid phases.

The range of applications is therefore, extensive. The range of theories is less so, since the discussion revolves around the continuum thermodynamical approach of Gibbs, whereby the evolving nucleus is represented as a continuous phase occupying a certain defined volume, plus a surface phase introduced to take account of the differences with respect to reality. It is assumed without comment that continuum methods, appropriate to large systems, apply to the cases of small nuclei.

There is a short but entirely adequate discussion of density functional methods, but little mention of molecular methods (except some rough models) and the techniques of statistical mechanics and phenomenological models are not included at all. Details of the precise definition of a nucleus (or more accurately a molecular cluster) therefore, do not really enter the discussion, apart from some comments on the choice of where to place the dividing surface. Nevertheless the author gives a masterful account of the methods of continuum thermodynamics, and applications of the resulting formulae.

A nice feature of the book is that it starts with a familiar example of a system capable of a first order phase transition, namely the van der Waals fluid. The thermodynamic driving force for the nucleation of this transition, and concepts such as the equilibrium line and spinodal decomposition are illustrated.

The thermodynamics and kinetics of nucleation are developed in such a way as to derive the so-called nucleation theorem. This important result allows nucleation rate data to be used to determine the size of the critical nucleus. Fragments of new phase are hard to create out of the old phase (unless conditions are suitable for spinodal decomposition), but the 'critical' nucleus is sufficiently large that is equally likely to grow into the new phase, or decay into the old phase. It is the 'activated complex' of nucleation processes, and is usually only a few tens or hundreds of molecules in size. The rate of creation of critical nuclei is linked directly to the observed rate of nucleation of larger particles or droplets.

The core of the book is devoted to the application of the nucleation theorem to stationary and non-stationary nucleation processes. In the former case it is the rate of nucleation, and in the latter case it is this rate together with the delay, or induction time that are examined in order to extract the critical size. The description of the method is followed by an analysis of actual experimental data. Data from some computer simulations are also studied.

Very recent developments in nucleation theorems, namely the use of nucleation rate data to obtain the energies of critical clusters as well as their size, have, unfortunately, been omitted. Surveys of the application of the nucleation theorem to multicomponent systems are also not included.

Nevertheless this is a valuable and well-constructed book. It contains a wealth of references to the nucleation literature, including many important papers from the former Eastern Bloc. This is a reflection of the author's experience and standing in the field. It discusses work that was hitherto distributed in various journals and the collection and expansion of this material as a book is extremely useful. It is a book for anyone wishing to get to grips with the core theoretical aspects of a difficult and often bewildering subject. The way it clarifies details of the thermodynamics alone makes it an absolute must for researchers working in the field of the nucleation of phase transitions.

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