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Book review

From Macromolecules to Man

R.B. Kemp (Ed.), Handbook of Thermal Analysis and Calorimetry, Vol. 3, (P.K. Gallagher (Series Ed.)), Elsevier, 1999

One of the strengths of calorimetry and thermal analysis is the astonishing breadth of systems to which this family of techniques may be applied. This is amply exemplified by the comprehensive text compiled by Richard Kemp dealing with biological applications of thermal techniques. The book contains over 1000 pages and brings together contributions dealing with biomolecular science, tissue and whole organism calorimetry, food science and pharmaceutical applications. The net result is a truly intriguing and highly informative reference source that will not only be of considerable aid to those working in these respective fields but also, as this reviewer has found, will spark off new ideas and perspectives by facilitating cross-fertilisation of knowledge between related subject areas.

Dealing firstly with the subject matter of the book, the initial chapters cover calorimetry and thermal analysis of biomolecules, particularly nucleic acids, proteins and lipids. The chapters then focus on different aspects of what is really the heart of the book, namely the use of calorimetric techniques for the characterisation of biological cells, tissues and organisms, this being followed by a small number of chapters that deal with more diverse issues such as pharmaceuticals, foods and polymers. This focus on macroscopic biocalorimetry is appropriate, given the existing availability of texts dealing with biomolecules and pharmaceuticals in a thermal context. Within this core sphere of interest a fascinating range of issues is addressed, including metabolic studies on microbial cultures and other cellular systems, whole body calorimetry, plant tissue metabolism and medical applications of calorimetry to name but a few. On this basis, it is likely that this book will be the definitive

modern reference source on the field for many years to come.

Readers are advised to take the time to look at the editor's preface to the book, not simply for the information it contains but also for an insight into the style and mood of the text to follow. Such prefaces are normally fairly dry affairs, giving a brief precis of the contents to come and offering thanks to the relevant parties. This is written in a somewhat different style and indicates the degree of verve and enthusiasm with which the contributors have approached their chapters. Indeed, one gets a strong feeling throughout of the enjoyment the authors take from their work and this is a major factor with regard to the readability of the text.

In terms of the target audience, there can be little doubt that the book will be invaluable to those working in the field. The question does arise, however, as to whether the book will make new converts; indeed the editor notes in the preface that he hopes the book will serve to assist more scientists to '... realise the potential of heat measurements in their research ...'. On first viewing, the impression to the cynical outsider may well be of a fascinating but in places esoteric field. For example, in a chapter dealing with the study of wood and wood products, the author comments that there have been very few thermo-analytical studies on musical instruments, a statement that will not be greeted with great surprise by a general audience. However, this apparently facetious example also serves to illustrate the counter-argument in that the author goes on to convincingly outline the relevance of such knowledge to the understanding of, for example, the difference in wood properties between a Stradivari violin and a modern violin produced from a tree of equivalent age. It should also be emphasised, in fairness to the author, that the majority of the chapter deals with much more mainstream applications and indeed is highly readable and informative. Similarly, the measurement of the enthalpies associated with plant metabolism may not have immediately obvious

applications to the uninitiated but the authors concerned present strong arguments for the use of the method for the assessment of the effects of environmental conditions on plant growth and for long-term growth prediction for trees. The point being made is that these studies are indeed important and relevant but may sometimes suffer from the problem that besets all interdisciplinary research, namely that of becoming fully integrated and publicised within either or both host fields.

I have one criticism of the book and that lies in the manner in which it has been printed. There are no headers to help guide the reader through what is a very substantial tome and the print layout often changes from chapter to chapter, with alterations in line spacing occurring in a single page in some cases. The presence of a spelling mistake on the first page is also somewhat unfortunate. These are not major difficulties but they do serve as a distraction to what is an otherwise excellent text.

Overall, I have no hesitation in recommending this book for three principal reasons. Firstly, it will be of

great use to those working within the field. Secondly, by reading chapters on subjects that are not directly in one's own area, it is possible to generate numerous ideas; this reviewer produced a long list of possible project areas as a direct result of reading the text. Finally, the book is to be recommended because it is fascinating to read, over and above any considerations of relevance. Indeed, any scientist who picks up a book containing a chapter entitled 'Calorimetry of Small Animals' and does not feel at least intrigued should definitely find an alternative vocation.

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