

Book Review

Thermal Methods of Analysis, Principles, Applications and Problems

by **Peter J. Haines**

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Thermal Methods of Analysis is a welcomed book in the thermal analysis field. The theoretical aspects of the thermal methods applied in studying physical properties, chemical reactions or thermal behaviour of a large variety of materials, are accompanied by detailed description of instrumentation, techniques of operation and data analysis. The impressive number of applications presented and the solved problems make the book even more valuable.

The book consists of 6 chapters, each followed by bibliographic references. Every chapter contains definitions and theoretical information concerning the particular methods referred to, as well as problems and applications. A great number of drawings, diagrams, graphs and tables are presented.

Chapter 1, *Introduction to thermal methods*, contains basic information about the use of computers in thermal analysis and the factors affecting the thermal analysis results.

Chapter 2, *Thermogravimetry*, describes the apparatus, the kinetics of reactions and applications of thermogravimetry, such as analysis of mixtures, oxidation and reduction studies. Information about the controlled rate thermogravimetry and TCA are also presented.

Chapter 3, *Differential thermal analysis and differential scanning calorimetry* (coauthor F.W. Wilburn), contains detailed descriptions of the instruments used for DTA and DSC studies, as well as ample explanations of the phenomena involved and of the interpretations of the results. Melting of materials, crystalline phase transitions, polymorphism, phase diagrams, glass transitions, thermoplastic polymer changes, are some of the applications detailed in this chapter.

Chapter 4, *Thermomechanical, dynamic mechanical and associated methods* (coauthor M. Reading), refers to instrumentation and applications of TMA, DMA, and also dynamic mechanical analysis, dielectric thermal analysis, thermally stimulated current analysis and relaxation map analysis.

Chapter 5, *Simultaneous techniques and product analysis*, describes different techniques involving complementary analysis for a complex understanding of the processes occurring. TD-DTA and TG-DSC, evolved gas analysis, infrared and simultaneous TA-infrared, thermomicroscopy, X-ray methods and electron microscopy are some of the detailed techniques presented.

Chapter 6, *Problem solving and applications of thermal methods*, covers a large variety of subjects in the field of materials' studies: inorganic materials, polymeric materials, fine chemicals and pharmaceuticals are only a few of them.

The layout of the book rates recognition as it greatly contributes to the readability of its contents. The texts and graphics are very well organized into a visually pleasing arrangement, although the fonts are a bit small. This problem is quite pronounced with the legends on some figures.

The book is extremely useful to anyone interested in thermal methods of analysis and studies of materials' properties. It is a very helpful book and should be present in the working libraries of all those involved in this field.

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