1. Record Nr. UNINA9911019273003321

Titolo	Principles and applications of thermal analysis / / edited by Paul Gabbott
Pubbl/distr/stampa	Oxford, : Blackwell Pub., 2008
ISBN	9786612122958 9781282122956 1282122959 9780470697702 0470697709 9780470698129 0470698128
Descrizione fisica	1 online resource (484 p.)
Altri autori (Persone)	GabbottPaul
Disciplina	543.26 543/.26
Soggetti	Thermal analysis Colorimetric analysis Thermal analysis - Industrial applications
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Principles and Applications of Thermal Analysis; Contents; Abbreviations; List of Contributors; 1 A Practical Introduction to Differential Scanning Calorimetry; 1.1 Introduction; 1.2 Principles of DSC and types of measurements made; 1.2.1 A definition of DSC; 1.2.2 Heat low measurements; 1.2.3 Specific heat (Cp); 1.2.4 Enthalpy; 1.2.5 Derivative curves; 1.3 Practical issues; 1.3.1 Encapsulation; 1.3.2 Temperature range; 1.3.3 Scan rate; 1.3.4 Sample size; 1.3.5 Purge gas; 1.3.6 Sub-ambient operation; 1.3.7 General practical points; 1.3.8 Preparing power compensation systems for use 1.4 Calibration1.4.1 Why calibrate; 1.4.2 When to calibrate; 1.4.3 Checking performance; 1.4.4 Parameters to be calibrated; 1.4.5 Heat low calibration; 1.4.6 Temperature calibration; 1.4.7 Temperature control (furnace) calibration; 1.4.8 Choice of standards; 1.4.9 Factors affecting calibration; 1.4.10 Final comments; 1.5 Interpretation of data;

1.5.1 The instrumental transient; 1.5.2 Melting; 1.5.3 The glass transition; 1.5.4 Factors affecting Tg; 1.5.5 Calculating and assigning Tg; 1.5.6 Enthalpic relaxation; 1.5.7 Tg on cooling; 1.5.8 Methods of obtaining amorphous material; 1.5.9 Reactions
1.5.10 Guidelines for interpreting data1.6 Oscillatory temperature profiles; 1.6.1 Modulated temperature methods; 1.6.2 Stepwise methods; 1.7 DSC design; 1.7.1 Power compensation DSC; 1.7.2 Heat flux DSC; 1.7.3 Differential thermal analysis DTA; 1.7.4 Differential photocalorimetry DPC; 1.7.5 High-pressure cells; Appendix: standard DCS methods; References; 2 Fast Scanning DSC; 2.1 Introduction; 2.2 Proof of performance; 2.2.1 Effect of high scan rates on standards; 2.2.2 De.nition of HyperDSCTM; 2.2.3 The initial transient; 2.2.4 Fast cooling rates; 2.3 Benefits of fast scanning rates
2.3.1 Sensitivity2.3.2 Measurement of sample properties without unwanted annealing effects; 2.3.3 Separate overlapping events based on different kinetics; 2.3.4 Speed of analysis; 2.4 Application to polymers; 2.4.1 Melting and crystallisation processes; 2.4.2 Comparative studies; 2.4.3 Forensic studies; 2.4.4 Effect of heating rate on the sensitivity of the glass transition; 2.4.5 Effect of heating rate on the temperature of the glass transition; 2.4.6 Effect of heating rate on Tg of annealed materials (and enthalpic relaxation phenomena); 2.5 Application to pharmaceuticals
2.5.1 Purity of polymorphic form2.5.2 Identifying polymorphs; 2.5.3 Determination of amorphous content of materials; 2.5.4 Measurements of solubility; 2.6 Application to water-based solutions and the effect of moisture; 2.6.1 Measurement of Tg in frozen solutions and suspensions; 2.6.2 Material affected by moisture; 2.7 Practical aspects of scanning at fast rates; 2.7.1 Purge gas; 2.7.2 Sample pans; 2.7.3 Sample size; 2.7.4 Scan rate; 2.7.5 Instrumental settings; 2.7.6 Cleanliness; 2.7.7 Getting started; References; 3 Thermogravimetric Analysis; 3.1 Introduction
3.2 Design and measuring principle

Sommario/riassunto

Principles and Applications of Thermal Analysis is written by manufacturers and experienced users of thermal techniques. It provides sound practical instruction on using the techniques and gives an up-to-date account of the principle industrial applications. By covering basic thermogravimetric analysis (TGA), differential scanning calorimetry (DSC) including Fast Scanning DSC, together with dynamic mechanical analysis (DMA /TMA) methods, then discussing industrial applications, the book serves as an ideal introduction to the technology for new users. With a strong focus on practical issues, th