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	Nota di contenuto	Part 1. Advanced Instrumentation, Techniques and Methods -- Concepts and Practice of Material Characterization Using Fast Scanning Calorimetry -- Non-adiabatic Scanning Calorimeter For Controlled Fast Cooling and Heating -- Quasi-adiabatic, Membrane-based, Highly Sensitive Fast Scanning Nanocalorimetry -- Fast Scanning Calorimetry— Fast Thermal Desorption Technique: The Thin Wire Approach -- Fast Scanning Calorimetry of Silk Fibroin Protein: Sample Mass and Specific Heat Capacity Determination -- Scanning AC Nano-calorimetry and its Applications -- Isoconversional Kinetics by Fast Scanning Calorimetry -- Reliable Absolute Vapor Pressures of Extremely Low Volatile Compounds From Fast Scanning Calorimetry -- Part 2. Combination

with Analytical Techniques and Molecular Simulations -- Design of an in-Situ Setup Combining Nanocalorimetry and Nano- or Micro-Focus X-Ray Scattering to Address Fast Structure Formation Processes -- Combining Fast Scanning Chip-Calorimetry With Structural and Morphological Characterization Techniques -- Integration of FSC with Microstructural Analysis Techniques -- Combining Fast-scan Chip-calorimetry with Molecular Simulations to Investigate Polymer Crystal Melting -- Part 3. Dynamics of (de)vitrification -- Cooling Rate Dependent Glass Transition in Thin Polymer Films and in Bulk -- The Glass Transition and Structural Recovery Using Flash DSC -- Part 4. Metastability and Reorganization in relation to Crystallization and Melting -- New Insights into Polymer Crystallization by Fast Scanning Chip Calorimetry -- Mesophase Formation in iPP Copolymers -- Industrial Applications of Fast Scanning DSC – New Opportunities for studying Polyolefin Crystallization -- Full-Temperature Range Crystallization Rates of Polyamides by FSC as Key to Processing -- Kinetic Studies of Melting, Crystallization, and Glass Formation -- Nucleation Kinetics Analyses of Deeply Undercooled Metallic Liquids by Fast Scanning Calorimetry -- Fast Scanning Calorimetry of Phase Transitions in Metals -- Precipitation- and Dissolution-Kinetics in Metallic Alloys with Focus on Aluminium Alloys by Calorimetry in a Wide Scanning Rate Range -- Martensitic Transformation of NiMnGa Shape Memory Alloys Thin Films Studied by Flash DSC.

| Sommario/riassunto | In the past decades, the scan rate range of calorimeters has been extended tremendously at the high end, from approximately 10 up to 10 000 000 °C/s and more. The combination of various calorimeters and the newly-developed Fast Scanning Calorimeters (FSC) now span 11 orders of magnitude, by which many processes can be mimicked according to the time scale(s) of chemical and physical transitions occurring during cooling, heating and isothermal stays in case heat is exchanged. This not only opens new areas of research on polymers, metals, pharmaceuticals and all kinds of substances with respect to glass transition, crystallization and melting phenomena, it also enables in-depth study of metastability and reorganization of samples on an 1 to 1000 ng scale. In addition, FSC will become a crucial tool for understanding and optimization of processing methods at high speeds like injection molding. The book resembles the state-of-the art in Thermal Analysis & Calorimetry and is an excellent starting point for both experts and newcomers in the field. . |