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| Soggetti | Ceramics<br>Glass<br>Composites (Materials)<br>Composite materials<br>Analytical chemistry<br>Materials science<br>Ceramics, Glass, Composites, Natural Materials<br>Analytical Chemistry<br>Materials Science, general |
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| Nota di bibliografia | Includes bibliographical references and index. |
| Nota di contenuto | Some Fundamental and Historical Aspects of Phenomenological Kinetics in the Solid-State Studied by Thermal Analysis -- Equilibrium background of processes iniciated by heating and Ehrenfest's classification of phase transitions -- Crystal defects and nonstoichiometry contributions to heat capacity of solids -- Forty years of the Turnbull reduced glass-transition temperature and Hrubý glass-forming coefficient and their current perception -- Heat transfer and phase transition in DTA experiment -- Determination of the glass transition by DSC: a comparison of conventional and dynamic techniques -- Structural relaxation and viscosity behavior in supercooled liquids at the glass transition -- Kinetics of structural |

relaxation in glasses -- Kinetics of crystal nucleation in closed systems -- Influence of preliminary nucleation on the physico-geometrical kinetics of glass crystallization -- Application of isoconversional methods for the processes occurring in glassy and amorphous materials. Fractals in solid state processes -- Crystallization of metallic micro-, nano- and non-crystalline alloys -- Crystallization kinetics in amorphous materials studied by means of calorimetry, microscopy and dilatometry -- Comments on DTA/DSC methods for estimation of crystal nucleation rates in glass-forming melts -- Non-parametric kinetic methods -- Electron transport studies of disorder and dimensionality in nanocrystalline diamond -- Controlled Nucleation and Crystallization for Nanoparticle Synthesis -- Nucleation on strongly curved surfaces of nanofibers -- Thermal analysis of waste glass batches: effect of batch makeup on gas-evolving reactions -- Amorphous inorganic polysialates — geopolymeric composites and the bioactivity of hydroxyl groups -- Oxide superconductors as model systems for studying phase relations, stoichiometry, reaction kinetics and unconventional glass formability.

Sommario/riassunto

Thermal Analysis of Micro-, Nano- and Non-Crystalline Materials: Transformation, Crystallization, Kinetics and Thermodynamics complements and adds to volume 8 Glassy, Amorphous and Nano-Crystalline Materials by providing a coherent and authoritative overview of cutting-edge themes in the field of crystalline materials. In particular, the book focuses on reaction thermodynamics and kinetics applied to solid-state chemistry and thermal physics of various states of materials. In this volume the fundamental and historical aspects of phenomenological kinetics and the equilibrium background of processes are detailed. Crystal defects, non-stoichiometry and nano-crystallinity, reduced glass-transition temperatures and glass-forming coefficients are covered. The determination of the glass transition by DSC, the role of heat transfer and phase transition in DTA experiments, and the explanation of DTA/DSC methods used for the estimation of crystal nucleation are reviewed. Structural relaxation and viscosity behaviour in glass and associated relaxation kinetics are also examined, together with the influence of preliminary nucleation and coupled phenomenological kinetics nucleation on both the strongly curved surfaces and nano-particles. The book investigates crystallization of glassy and amorphous materials including oxides, chalcogenides and metals, non-parametric and fractal description of kinetics, disorder and dimensionality in nano-crystalline diamond. Moreover, it analyzes thermal analysis of waste glass batches, amorphous inorganic polysialates and bioactivity of hydroxyl groups as well as reaction kinetics and unconventional glass formability of oxide superconductors. Written by an international array of distinguished academics, Thermal Analysis of Micro-, Nano- and Non-Crystalline Materials: Transformation, Crystallization, Kinetics and Thermodynamics is a valuable resource to advanced undergraduates, postgraduates, and researches working in the fields of applied material thermodynamics, thermal analysis, thermophysical measurements and calorimetry.