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Titolo	Liquid phase epitaxy of electronic, optical, and optoelectronic materials [[electronic resource] /] / edited by Peter Capper, Michael Mauk
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Collana	Wiley series in materials for electronic and optoelectronic applications
Altri autori (Persone)	CapperPeter MaukMichael
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Note generali	Description based upon print version of record.
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Nota di contenuto	Liquid Phase Epitaxy of Electronic, Optical and Optoelectronic Materials; Contents; Series Preface; Preface; Acknowledgements; List of Contributors; 1 Introduction to Liquid Phase Epitaxy; 1.1 General aspects of liquid phase epitaxy; 1.2 Epitaxial growth modes, growth mechanisms and layer thicknesses; 1.3 The substrate problem; 1.4 Conclusions; Acknowledgements; References; 2 Liquid Phase Epitaxy in Russia Prior to 1990; 2.1 Introduction; 2.2 Specific features of growth of quantum-well heterostructures by LPE; 2.2.1 LPE growth from a capillary; 2.2.2 Low-temperature LPE 2.2.3 LPE growth of InGaAsP quantum well heterostructures2.3 Rare-earth elements in LPE technology of some III-V binary compounds and solid solutions; 2.4 Conclusions; Acknowledgements; References; 3 Phase Diagrams and Modeling in Liquid Phase Epitaxy; 3.1 Introduction; 3.2 Equilibrium phase diagrams; 3.2.1 Binary, ternary and quaternary phase diagrams; 3.2.2 Calculation of binary, ternary and quaternary phase diagrams; 3.2.3 Calculation of phase diagrams considering the surface, interface and strain energies; 3.2.4 Experimental determination of phase diagrams; 3.2.5 Miscibility gap 3.3 Technologies of LPE growth3.4 III-V materials for LPE growth; 3.5 Lattice matching; 3.6 Growth of misfit-dislocation-free wafers; 3.7 Phase diagrams of growth mode; 3.8 Growth kinetics; 3.8.1 Calculation of III-V layer thickness; 3.8.2 Compositional variation in III-V ternary layers; 3.9 Summary; References; Appendix; 4 Equipment and Instrumentation for Liquid Phase Epitaxy; 4.1 Introduction; 4.2 Overview, general description and operation of horizontal slideboat LPE system; 4.3 Crucibles and slideboats; 4.4 Alternative slideboat designs; 4.5 Furnaces and heating; 4.6 LPE ambient 4.7 Tubes, sealing and gas handling4.8 Controllers and heating; 4.9 Temperature measurements and other instrumentation; 4.10 Safety; 4.11 Production LPE systems; References; 5 Silicon, Germanium and Silicon-Germanium Liquid Phase Epitaxy; 5.1 Introduction and scope of review; 5.2 Historical perspective; 5.3 Basis of silicon and germanium LPE; 5.3.1 Nucleation of silicon from a molten metal solution; 5.4 Silicon LPE methods; 5.4.1 Steady-state methods of solution growth and LPE; 5.5 Solvent selection; 5.6 Low-temperature silicon LPE 5.7 Purification of silicon for solar cells in an LPE process5.8 Electrical properties of LPE-grown silicon; 5.9 LPE of Si- and Ge-based alloys; 5.10 Selective LPE and liquid phase ELO; 5.11 Solar cells; 5.11.1 Epitaxial silicon solar cells by LPE; 5.11.2 Si solution growth on nonsilicon substrates for solar cells; 5.12 Other applications of silicon and germanium LPE; 5.13 Conclusions and outlook; References; Appendix 1. Phase equilibria modeling: The silicon-metal liquidus; A1. 1 The silicon-metal binary liquidus; A1.2 Alloy solvents; Appendix 2. Impurities and doping in silicon LPE Appendix 3. Effects of oxygen and water vapor in Si LPE
Sommario/riassunto	Liquid-Phase Epitaxy (LPE) is a technique used in the bulk growth of crystals, typically in semiconductor manufacturing, whereby the crystal is grown from a rich solution of the semiconductor onto a substrate in layers, each of which is formed by supersaturation or cooling. At least 50% of growth in the optoelectronics area is currently focussed on LPE. This book covers the bulk growth of semiconductors, i.e. silicon,

gallium arsenide, cadmium mercury telluride, indium phosphide, indium antimonide, gallium nitride, cadmium zinc telluride, a range of wide-bandgap II-VI compounds, diamond and