

Handbook of Crystal Growth, Volume 3A-3B, Second Edition: Thin Films and Epitaxy

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Volume IIIA Basic Techniques Handbook of Crystal Growth, 2nd Edition Volume IIIA (Basic Techniques), edited by chemical and biological engineering expert Thomas F. Kuech, presents the underpinning science and technology associated with epitaxial growth as well as highlighting many of the chief and burgeoning areas for epitaxial growth. Volume IIIA focuses on major growth techniques which are used both in the scientific investigation of crystal growth processes and commercial development of advanced epitaxial structures. Techniques based on vacuum deposition, vapor phase epitaxy, and liquid and solid phase epitaxy are presented along with new techniques for the development of three-dimensional nano-and micro-structures.

Volume IIIB Materials, Processes, and Technology Handbook of Crystal Growth, 2nd Edition Volume IIIB (Materials, Processes, and Technology), edited by chemical and biological engineering expert Thomas F. Kuech, describes both specific techniques for epitaxial growth as well as an array of materials-specific growth processes. The volume begins by presenting variations on epitaxial growth process where the kinetic processes are used to develop new types of materials at low temperatures. Optical and physical characterizations of epitaxial films are discussed for both in situ and exit to characterization of epitaxial materials. The remainder of the volume presents both the epitaxial growth processes associated with key technology materials as well as unique structures such as monolayer and two dimensional materials.

Volume IIIA Basic Techniques

- Provides an introduction to the chief epitaxial growth processes and the underpinning scientific concepts used to understand and develop new processes.
- Presents new techniques and technologies for the development of three-dimensional structures such as quantum dots, nano-wires, rods and patterned growth
- Introduces and utilizes basic concepts of thermodynamics, transport, and a wide cross-section of kinetic processes which form the atomic level text of growth process

Volume IIIB Materials, Processes, and Technology

- Describes atomic level epitaxial deposition and other low temperature growth techniques
- Presents both the development of thermal and lattice mismatched streams as the techniques used to characterize the structural properties of these materials
- Presents in-depth discussion of the epitaxial growth techniques associated with silicone silicone-based materials, compound semiconductors, semiconducting nitrides, and refractory materials

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Editorial Review

Review

"...any library in the materials science or chemical engineering departments of universities should carry these volumes.... I would recommend it to academics in the crystal growth field who want to have a complete reference work they can use to ensure their students are well grounded in the fundamentals and also to industrial crystal-growers who now and then need to understand why it is that what they do actually works." **--Advanced Materials**

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