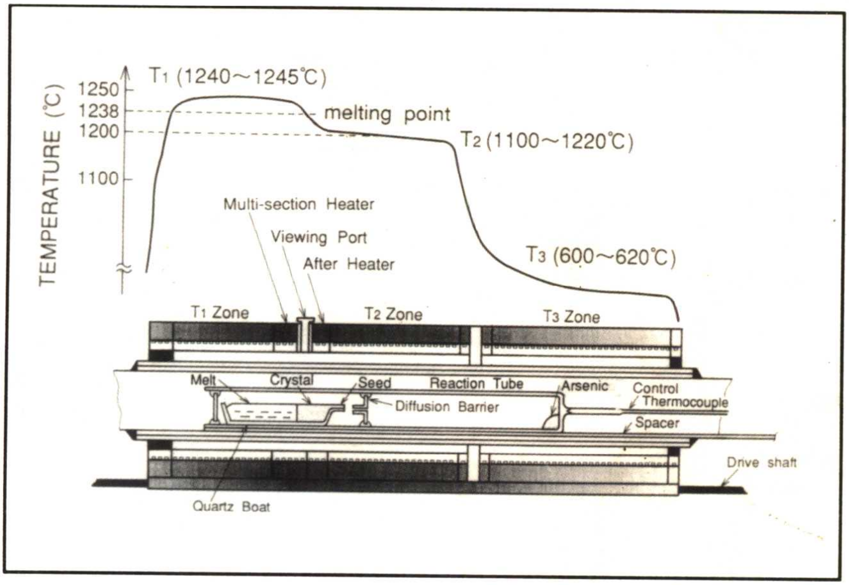
HANDBOOK OF COMPOUND SEMICONDUCTORS

Growth, Processing, Characterization, and Devices



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Preface

This book is a state-of-the-art reference on the growth and processing of compound semiconductors. The leading experts in the important growth techniques, processing steps, characterization methods, packaging, and devices have contributed their knowledge. While the scope of the book is compound semiconductors, there are so many different semiconductors being studied and used that complete coverage of all materials is impossible in one book. Therefore the emphasis in this book is on gallium-arsenide– and indium-phosphide–based materials. Several other III-V and some II-VI compound semiconductors are discussed where they provide particular insight or illustrate specific properties and/or processes.

Chapters in the book provide a complete overview of the technologies necessary to grow bulk single-crystal substrates, and grow hetero- and homoepitaxial films using molecular beam epitaxy (MBE) or metal-organic chemical vapor deposition (MOCVD). Technologies necessary to process compound semiconductors into test structures and devices are covered, including electrical contacts, dielectric isolation, interface passivation, ion implantation, wet and dry etching, and rapid thermal processing. Techniques to characterize the materials and devices using electrons, ions, and photons, are described. While the emphasis of the book is on materials growth and processing, the technologies are placed in perspective by a review of the important electronic and optoelectronic devices, and epitaxial lift-off, and other device packaging issues.

With this complete coverage of the critical topics, we believe the book will be a valuable reference for persons currently performing research on compound semiconductors. It will also be an excellent reference for advanced graduate courses in materials science, electrical engineering, and applied physics. In our judgement, the authors of the chapters have provided exceptionally comprehensive, authoritative work, and for this we are extremely grateful.

September, 1995

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