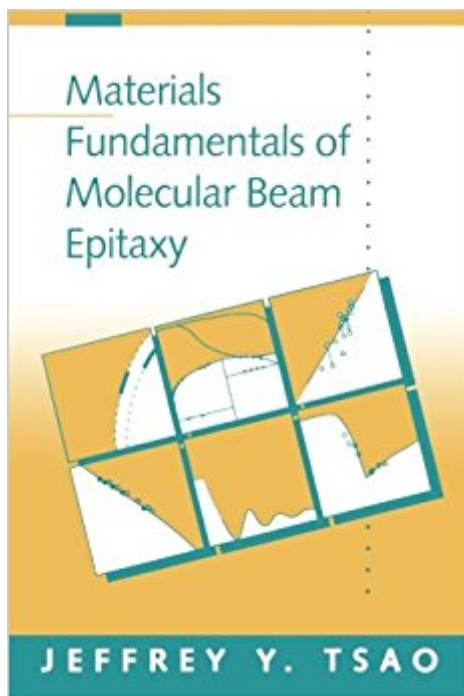


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# Materials Fundamentals Of Molecular Beam Epitaxy



## Synopsis

The technology of crystal growth has advanced enormously during the past two decades. Among these advances, the development and refinement of molecular beam epitaxy (MBE) has been among the most important. Crystals grown by MBE are more precisely controlled than those grown by any other method, and today they form the basis for the most advanced device structures in solid-state physics, electronics, and optoelectronics. As an example, Figure 0.1 shows a vertical-cavity surface emitting laser structure grown by MBE. \* Provides comprehensive treatment of the basic materials and surface science principles that apply to molecular beam epitaxy\* Thorough enough to benefit molecular beam epitaxy researchers\* Broad enough to benefit materials, surface, and device researchers\* References articles at the forefront of modern research as well as those of historical interest

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## Customer Reviews

Crystals grown by molecular beam epitaxy (MBE) form the basis for today's most advanced device structures in solid-state physics, electronics and optoelectronics. Materials Fundamentals of Molecular Beam Epitaxy gathers together the basic materials science principles that apply to MBE, and treats in great depth its most important aspects. The book begins with basic materials science and solid-state physics concepts, and ends at the frontiers of modern research. Throughout, it teaches the usefulness of thermodynamic and statistical calculations based on intuitive and physically motivated semi-empirical models. Materials Fundamentals of Molecular Beam Epitaxy is

thorough enough to benefit graduate students and professional researchers, yet it is also broad enough to benefit materials, surface, and device researchers interested in gaining a deeper appreciation of the modern science of epitaxy.

very good book, focused on thermal dynamics of MBE growth.

I first heard Jeff Tsao speak at a conference in the late 1980's, on the role of excess stress in dislocation generation and kinetics in heteroepitaxial thin films. His lecture proved to be one of the ten best lectures that I have heard in my 35 year career in materials research. His publications on this topic were also of unsurpassed excellence. Drawing on his brilliant research, Jeff Tsao went on to write this unique and comprehensive book on molecular beam epitaxy (MBE) and thin film growth. This book covers all of the important aspects of MBE growth, from thermodynamic concepts like phase equilibria, to the mechanics of lattice mismatch and dislocation generation. To the best of my knowledge this is the only book addressing these important topics in a unified way. Given the wide array of technologically important electronic and opto-electronic device structures that can only be grown by MBE, this is an important book indeed! This book is a valuable resource for not only MBE growers, but for thin film growers who use other growth techniques, as well as for those of us involved in the characterization and theory of thin films.

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