## Perovskites and High $T_c$ Superconductors

*Francis S. Galasso*

*(Gordon and Breach Science Publishers, 1990, 293 pages).*
*ISBN: 2-88124-391-6*

This book details the structure, properties, and preparation of perovskite-structured oxides. It is based on a highly successful similar venture in 1969 and, presumably from the title, we can thank the current boom in perovskite-structured superconductors for this updated version.

In its new guise the book is an excellent twelve-chapter introduction to the subject. It is written clearly and concisely, and information is easily extracted from the highly detailed data sections. The standard of each chapter is uniformly good starting with Chapter 2, which is a beautiful exposition of the structural features allowed in basic and substituted perovskite materials. This chapter contains probably the most comprehensive list of unit cell data known to this reviewer.

Chapter 3 elucidates the structure of perovskite materials using x-ray techniques for powders and precession photographs for single crystals. Chapter 4 deals with the basic electronic conduction properties found in these materials and, after a brief discussion on the highly conducting bronzes, continues with the production of controlled valency semiconductors.

The following chapter extends the field to cover ferroelectricity in titanates, niobates, and tantalates. The discussion includes most of the standard classic systems. This chapter ends with a brief overview of the applications of ferroelectric materials.

The next four chapters give a brief introduction to the subjects of phase transitions, ferromagnetism, optical properties, and catalytic activity in perovskite materials. Chapters 10 and 11 deal with the preparation of perovskite-structured oxides, carbides, nitrides, and halides. After an all-too brief discussion on powder and thin film preparation (this section should certainly be expanded in any future version of the book), the emphasis in the oxide section is very much on single-crystal growth. The final chapter deals competently with some of the basic properties of the high temperature superconductors.

The author has a long and distinguished association with the growth and properties of perovskites, and sections of this book almost read as a lab book of how to work with these materials. As such, it cannot be recommended highly enough to graduate students or anyone beginning to work with these types of materials. There are enough detailed data and informed insights in this book to ensure that even experienced researchers should find a space for it on their shelves.

*Reviewer: Francis Beech is the solid-state chemist in residence in the Electronic and Electrical Engineering Department at University College London. His research interests focus on the electronic properties of oxide ceramics.*

## Sintering of Advanced Ceramics

*(Vol. 7, Ceramic Transactions)*
*Edited by Carol A. Handwerker, John E. Blendell, and Wolfgang A. Kaysser*

*(American Ceramic Society, 1990, 789 pages).*
*ISBN: 0-944904-20-3*

This proceeding of a symposium "Sintering of Advanced Ceramics," held at the American Ceramic Society's Annual Meeting, Cincinnati, Ohio, May 2-4, 1988, collects both theoretical and experimental papers. The papers are organized sequentially to serve two major purposes, i.e., to recognize Dr. R.L. Coble for his pioneering work on sintering and sintering-related processes, and to provide a forum for discussing the state of sintering theory and experiment.

The book's six sections contain balanced numbers of papers: Sintering Paradigms: Current Status (5 papers), Models of Sintering and Grain Growth (6 papers), Model Experiments (12 papers), Liquid Phase Sintering and Creep of Two Phase Materials (6 papers), Sintering and Microstructure Development in Multicomponent Ceramics (10 papers), and Ceramic-Ceramic Composites (6 papers).

In terms of sintering practices, the book covers solid-state sintering, hot isostatic pressing, creep, and liquid-phase sintering of single-component and multicomponent ceramic (and one tungsten heavy alloy) systems. In terms of materials used, it covers a wide range of structural, electronic, and superconducting ceramics, with alumina as the most popularly used material.

The quality of the contents and illustrations is high because each individual paper was reviewed before publication. The tutorial papers make it a good reference source on current knowledge and future trends of sintering science. For example, the paper summarizing in chronicle form the evolution of the understanding of the sintering of alumina since Coble invented the high-density polycrystalline alumina "Lucalox" was particularly enlightening. Readers will easily find papers related to their research fields because this large volume covers such a diversity of topics in the sintering of advanced ceramics.

*Reviewer: Shun-Tian Paul Lin is with the Mechanical Engineering Department of the National Taiwan Institute of Technology.* □

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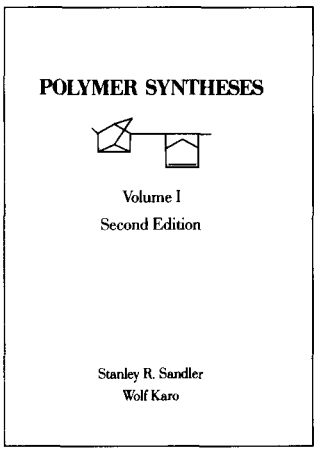


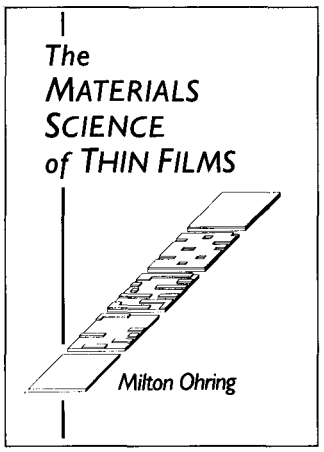


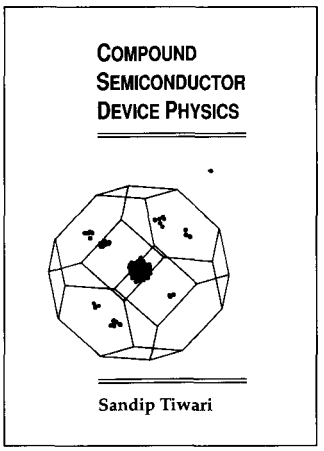


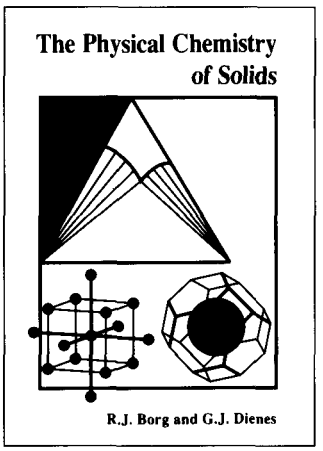


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