

Structure and Bonding in Crystalline Materials

By Gregory S. Rohrer

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How can elements be combined to produce a solid with specified properties? This book acquaints readers with the established principles of crystallography and cohesive forces needed to address the fundamental relationship among composition, structure and bonding. Starting with an introduction to periodic trends, the book discusses crystal structures and the various primary and secondary bonding types, and finishes by describing a number of models for predicting phase stability and structure. Its large number of worked examples, exercises, and detailed descriptions of numerous crystal structures make this an outstanding advanced undergraduate or graduate-level textbook for students of materials science.

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Structure and Bonding in Crystalline Materials By Gregory S. Rohrer Bibliography

- Sales Rank: #1289360 in Books
- Brand: Brand: Cambridge University Press
- Published on: 2001-07-30
- Original language: English
- Number of items: 1
- Dimensions: 9.72" h x 1.10" w x 6.85" l, 1.96 pounds
- Binding: Paperback
- 552 pages

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Review
'... a remarkably pointed example of how times have changed. The real strengths of the book are its depth of coverage, bridging advanced undergraduate and postgraduate work, and its material-based approach.' Joan Halfpenny, Chemistry of Britain

'... an approach to the subject of structure and bonding in crystalline solids ... can be recommended for everyone concerned with crystalline solids in the broadest sense, as a useful compendium and handbook of long-lasting value.' Peter Kroll, Angewandte Chemie

About the Author
Gregory S. Rohrer is a Professor of Materials Science and Engineering at Carnegie Mellon University. Prof. Rohrer was born in Lancaster, PA, in 1962. He received his bachelor's degree in Physics from Franklin and Marshall College in 1984 and his Ph.D. in Materials Science and Engineering from the University of Pennsylvania in 1989. At CMU, Prof. Rohrer is the director of the NSF sponsored Materials Research Science and Engineering Center. His research is directed toward understanding how the properties of surfaces and internal interfaces are influenced by their geometric and crystallographic structure, their stoichiometry, and their defect structure. Prof. Rohrer is an associate Editor for the Journal of the American Ceramic Society and his research earned a National Science Foundation Young Investigator Award in 1994.

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