



The Physics and Chemistry of Materials

Joel I. Gersten, Frederick W. Smith

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A comprehensive introduction to the structure, properties, and applications of materials

This title provides the first unified treatment for the broad subject of materials. Authors Gersten and Smith use a fundamental approach to define the structure and properties of a wide range of solids on the basis of the local chemical bonding and atomic order present in the material. Emphasizing the physical and chemical origins of material properties, the book focuses on the most technologically important materials being utilized and developed by scientists and engineers.

Appropriate for use in advanced materials courses, *The Physics and Chemistry of Materials* provides the background information necessary to assimilate the current academic and patent literature on materials and their applications. Problem sets, illustrations, and helpful tables complete this well-rounded new treatment.

Five sections cover these important topics:

- * Structure of materials, including crystal structure, bonding in solids, diffraction and the reciprocal lattice, and order and disorder in solids
- * Physical properties of materials, including electrical, thermal, optical, magnetic, and mechanical properties
- * Classes of materials, including semiconductors, superconductors, magnetic materials, and optical materials in addition to metals, ceramics, polymers, dielectrics, and ferroelectrics
- * A section on surfaces, thin films, interfaces, and multilayers discusses the effects of spatial discontinuities in the physical and chemical structure of materials
- * A section on synthesis and processing examines the effects of synthesis on the structure and properties of various materials

The Physics and Chemistry of Materials is a complete introduction to the structure and properties of materials for students and an excellent reference for scientists and engineers.

*An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department.

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