



# Symmetry, Group Theory, and the Physical Properties of Crystals

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By Richard C Powell

Springer Dez 2010, 2010. Taschenbuch. Book Condition: Neu. 23.5x15.5x cm. This item is printed on demand - Print on Demand Neuware - This book demonstrates the importance of symmetry in determining the properties of solids and the power of using group theory and tensor algebra to elucidate these properties. It provides the fundamentals necessary for the reader to understand how to utilize these techniques in many different applications without becoming lost in a heavy formal treatment of the subject matter. The book begins by discussing the concepts of symmetry relevant to crystal structures. This is followed by a summary of the basics of group theory and how it applies to quantum mechanics. Next is a discussion of the description of the macroscopic properties of crystals by tensors and how symmetry determines the form of these tensors. The basic concepts covered in these early chapters are then applied to a series of different examples including crystal field theory treatment of point defects in solids, molecular orbitals, two-photon processes, the optical properties of solids, the nonlinear optical properties of solids, lattice vibrations, the Jahn-Teller effect, and the effects of translational symmetry on electronic energy bands in solids. Emphasis is placed on showing...



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