Phase Transitions in Solids Under High Pressure

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The use of high-pressure techniques has become popular for studying the nature of substances and phenomena occurring in them, especially as a means of obtaining new materials (synthesis under high pressure) and processing known materials (hydroextrusion). A product of many years of research by the authors and their colleagues, **Phase Transitions in Solids under High Pressure** discusses the relationships of phase transformations in solids under high pressure, the mechanism of these transformations, crystal geometry, the effect of deformation, the conditions of formation, and preservation of the high-pressure phases under normal pressure.

The book begins with an introduction that describes the relationship of the thermodynamics of phase transformations and the kinetics of the transformations. This is followed by a chapter explaining the equipment and mostly original procedures for investigating phase transformation in solids under high hydrostatic and quasi-hydrostatic pressures. The book covers phase transformations under high pressure in a wide temperature range in the elements carbon, silicon, germanium, titanium, zirconium, iron, gallium, and cerium as well as in titanium- and iron-based alloys and $A^{I}B^{VII}$, $A^{II}B^{VI}$, and $A^{III}B^{V}$ compounds.

In addition, the book examines the kinetics of phase transformations in iron-based alloys in isobaric–isothermal conditions. The authors present results for phase transformations in deformation under high pressure, describe several non-trivial effects associated with phase transformations under high pressure, and analyze the kinetics and hysteresis of high-temperature and low-temperature phase transformations. They conclude by describing the role of investigations under high pressure for determining general relationships governing phase transformations in solids.

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