

## Chemical Change in Deforming Materials

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This book explains the unique changes that occur in materials when they are subjected to unequal compressions. Until now, this class of behaviors has been poorly understood. Thermodynamics has provided an excellent means of understanding and predicting material behavior at the macroscopic level; even when limited to equilibrium states, thermodynamic statements are widely useful, and with extension to nonequilibrium states, almost all observable behaviors are accessible to theory. But there is one resistant point: if a cylinder of material is more strongly compressed along its length than radially, it is in a nonequilibrium state no matter how ideal its condition in other respects. The effect of this type of nonequilibrium has not been successfully explored. The physical consequences are well known: the cylinder deforms in ways described by continuum mechanics. But the chemical consequences are less well understood. The purpose of this book is to provide the outline of a comprehensive approach to answering this question. The author's perspective differs from current technical literature by emphasizing two little-used equations that describe the cylinder's response, simplifying and clarifying the consequent chemical changes. The work will interest all geochemists, petrologists, structural geologists, and materials scientists who encounter the phenomenon. An explanation of the unique changes that occur in materials when they are subjected to unequal compressions. The effect of this type of nonequilibrium has not been fully explored before. The physical consequences are well known but the chemical consequences are less well understood. This book outlines a comprehensive approach to answering these questions.

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