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## Solid State Physics

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# Configurational Thermodynamics of Solid Solutions

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## Publisher Summary

This chapter reviews current theoretical models applicable to concentrated solid solutions. It focuses on concentrated solutions because dilute ones can be considered as special cases and because the interesting effects of clustering and ordering are most apparent at high solute concentrations. The extended ranges of solubility are often found in metallic systems, and for this reason most examples selected will refer to metals and alloys, although the models presented are equally applied to off-stoichiometric compounds, metallic or inorganic, and to amorphous solids. The chapter provides description of the state of the order of the system through suitable averaging procedures. It discusses the internal energy of solutions, from both electronic and elastic standpoints. The chapter presents free energy models, such as generalized Bragg-Williams's model, Landau theory, and cluster variation method. These models are applied to the study of phase equilibrium.

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