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2.2.7 Limitations of phase diagrams; 2.2.8 Some key phase diagrams; 2.2.9 Ternary phase diagrams; 2.3 Principles of alloy theory; 2.3.1 Primary substitutional solid solutions; 2.3.2 Interstitial solid solutions; 2.3.3 Types of intermediate phases; 2.3.4 Order-disorder phenomena; 2.4 The mechanism of phase changes; 2.4.1 Kinetic considerations; 2.4.2 Homogeneous nucleation; 2.4.3 Heterogeneous nucleation; 2.4.4 Nucleation in solids; Chapter 3 Crystal defects; 3.1 Types of imperfection; 3.2 Point defects
3.2.1 Point defects in metals3.2.2 Point defects in non-metallic crystals; 3.2.3 Irradiation of solids; 3.2.4 Point defect concentration and annealing; 3.3 Line defects; 3.3.1 Concept of a dislocation; 3.3.2 Edge and screw dislocations; 3.3.3 The Burgers vector; 3.3.4 Mechanisms of slip and climb; 3.3.5 Strain energy associated with dislocations; 3.3.6 Dislocations in ionic structures; 3.4 Planar defects; 3.4.1 Grain boundaries; 3.4.2 Twin boundaries; 3.4.3 Extended dislocations and stacking faults in close-packed crystals; 3.5 Volume defects; 3.5.1 Void formation and annealing
3.5.2 Irradiation and voiding3.5.3 Voiding and fracture; 3.6 Defect behavior in common crystal structures; 3.6.1 Dislocation vector diagrams and the Thompson tetrahedron; 3.6.2 Dislocations and stacking faults in fcc structures; 3.6.3 Dislocations and stacking faults in cph structures; 3.6.4 Dislocations and stacking faults in bcc structures; 3.6.5 Dislocations and stacking faults in ordered structures; 3.7 Stability of defects; 3.7.1 Dislocation loops; 3.7.2 Voids; 3.7.3 Nuclear irradiation effects; Chapter 4 Characterization and analysis; 4.1 Tools of characterization; 4.2 Light microscopy
4.2.1 Basic principles

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