1. Record Nr. UNINA9910144704403321

Autore	Levitin Valim
Titolo	High temperature strain of metals and alloys [[electronic resource]] : physical fundamentals / / Valim Levitin
Pubbl/distr/stampa	Weinheim ; ; Chichester, : Wiley-VCH, 2006
ISBN	1-280-85422-7 9786610854226 3-527-60795-1 3-527-60714-5
Descrizione fisica	1 online resource (181 p.)
Disciplina	620.1617 669.83
Soggetti	Metals - Effect of high temperatures on Alloys - Thermal properties Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	High Temperature Strain of Metals and Alloys; Contents; Introduction; 1 Macroscopic Characteristics of Strain of Metallic Materials at High Temperatures; 2 The Experimental Equipment and the in situ X-ray Investigation Technique; 2.1 Experimental Installation; 2.2 Measurement Procedure; 2.3 Measurements of Structural Parameters; 2.4 Diffraction Electron Microscopy; 2.5 Amplitude of Atomic Vibrations; 2.6 Materials under Investigation; 2.7 Summary; 3 Structural Parameters in High-Temperature Deformed Metals; 3.1 Evolution of Structural Parameters; 3.2 Dislocation Structure 3.3 Distances between Dislocations in Sub-boundaries3.4 Sub-boundaries as Dislocation Sources and Obstacles; 3.5 Dislocations inside Subgrains; 3.6 Vacancy Loops and Helicoids; 3.7 Total Combination of Structural Peculiarities of High-temperature Deformation; 3.8 Summary; 4 Physical Mechanism and Structural Model of Strain at High Temperatures; 4.1 Physical Model and Theory; 4.2 Velocity of Dislocations; 4.3 Dislocation Density; 4.4 Rate of the Steady-State Creep; 4.5 Effect of Alloying: Relationship between Creep

Sommario/riassunto

Creep and fatigue are the most prevalent causes of rupture in superalloys, which are important materials for industrial usage, e.g. in engines and turbine blades in aerospace or in energy producing industries. As temperature increases, atom mobility becomes appreciable, affecting a number of metal and alloy properties. It is thus vital to find new characterization methods that allow an understanding of the fundamental physics of creep in these materials as well as in pure metals.Here, the author shows how new in situ X-ray investigations and transmission electron microscope studies lead to