1. Record Nr. UNISALENTO991003230009707536

Autore	Caillard, Daniel
Titolo	Thermally activated mechanisms in crystal plasticity [e-book] / by D. Caillard, J.L. Martin
Pubbl/distr/stampa	Amsterdam ; Boston, Mass. : Pergamon, 2003
ISBN	9780080427034 0080427030
Descrizione fisica	xviii, 433 p. : ill. ; 25 cm
Collana	Pergamon materials series ; 8
Altri autori (Persone)	Martin, Jean-Luc, 1938-
Disciplina	620.11296
Soggetti	Materials at high temperatures Crystals - Plastic properties Electronic books.
Lingua di pubblicazione	Inglese
Formato	Risorsa elettronica
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index
Nota di contenuto	Experimental Charecterization of Dislocation Mechanisms, Interactions Between Dislocations and Small-size Obstacles, Frictional Forces in Metals, Dislocation Cross-slip, Experimental Studies of Peierls-Naborro-Type Friction Forces in Metals and Alloys, The Peierl-Nabarro Mechanisms in Covalent Crystals, Dislocations Climb, Dislocation Multiplication, Exhaustion and Work Hardening, Mechanical Behaviour of some ordered intermetallic
Sommario/riassunto	KEY FEATURES: <UL> <LI>A unified, fundamental and quantitative resource. The result of 5 years of investigation from researchers around the world</LI> <LI>New data from a range of new techniques, including synchrotron radiation X-ray topography provide safer and surer methods of identifying deformation mechanisms</LI> <LI>Informing the future direction of research in intermediate and high temperature processes by providing original treatment of dislocation climb</LI> </UL> DESCRIPTION: <P> <IT>Thermally Activated Mechanisms in Crystal Plasticity is a unified</IT>, quantitative and fundamental resource for material scientists investigating the strength of metallic materials of various structures at extreme temperatures. Crystal plasticity is usually controlled by a limited number of elementary dislocation mechanisms, even in complex structures. Those

which determine dislocation mobility and how it changes under the influence of stress and temperature are of key importance for understanding and predicting the strength of materials. The authors describe in a consistent way a variety of thermally activated microscopic mechanisms of dislocation mobility in a range of crystals. The principles of the mechanisms and equations of dislocation motion are revisited and new ones are proposed. These describe mostly friction forces on dislocations such as the lattice resistance to glide or those due to sessile cores, as well as dislocation cross-slip and climb. They are critically assessed by comparison with the best available experimental results of microstructural characterization, in situ straining experiments under an electron or a synchrotron beam, as well as accurate transient mechanical tests such as stress relaxation experiments. Some recent attempts at atomistic modeling of dislocation cores under stress and temperature are also considered since they offer a complementary description of core transformations and associated energy barriers. <P>In addition to offering guidance and assistance for further experimentation, the book indicates new ways to extend the body of data in particular areas such as lattice resistance to glide.