

Microstructural Evolution And High Strain Rate Mechanical

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Microstructural Evolution And High Strain

The microstructure observations confirm that the high strain rate mechanical behavior of the cobalt base superalloys specimens are directly related to the effects of the strain rate, temperature and the evolution of the microstructural texture. The strengthening mechanism in cobalt

Microstructural Evolution and High Strain Rate Mechanical ...

At large values of strain, the decrease and saturation of strain hardening rates are possibly due to the dynamic recovery, which is found to be extensive in the as-received and over-aged (H1150 condition) samples interpreted from the lower strain values of the respective samples (Fig. 10(a)).

Microstructural evolution and strain hardening behavior of ...

In this study, the high strain rate deformation behavior and the microstructure evolution of Zr-Cu-Al-Ni metallic glasses under various strain rates were investigated. The influence of strain and strain rate on the mechanical properties and fracture behavior, as well as microstructural properties was also investigated.

The Microstructural Evolution and Mechanical Properties of ...

Comprehensive transmission electron microscopical studies have been conducted for solution-hardened steels deformed at high (1000s⁻¹) and low (0.001s⁻¹) strain rates, in order to clarify the...

(PDF) Microstructural evolution at high strain rates in ...

The microstructural analysis demonstrates that dislocation motion are main deformatin mode to accommodate dynamic tensile deformation at high strain rates. In addition, the interactions of dislocation-dislocation and dislocation-second phase lead to the increase of flow stress and strain hardening with increasing strain rate.

Dynamic tensile properties and microstructural evolution ...

The dynamic tensile properties and microstructural evolution of an extruded EW75 magnesium alloy deformed at ambient temperature and different high strain rates (from 1000 to 3000 s⁻¹) along...

(PDF) Dynamic tensile properties and microstructural ...

A multiscale dislocation-based model was built to describe, for the first time, the microstructural evolution and strain-hardening of {332} 113 TWIP (twinning-induced plasticity) Ti alloys. This model not only incorporates the reduced dislocation mean free path by emerging twin obstacles, but also quantifies the internal stress fields present ...

Microstructural evolution and strain-hardening in TWIP Ti ...

A higher strain rate usually offers strengthening by promoting dislocation and twinning kinetics. Meanwhile, the increase of temperature due to dissipative heating during high-strain-rate deformation results in softening. The microstructural evolution and the resulting mechanical properties depend on the competition between both effects [34,35].

Microstructural evolution of a nanotwinned steel under ...

Microstructural evolution of the Al-Al 3 Ti composite deformed by FSP is investigated. Based on the distribution of the Al 3 Ti platelet particles, shear deformation behavior induced by FSP is discussed. The main results are as follows. (1) The Al 3 Ti particles are fragmented by the shear deformation induced by FSP. At the outside of the DXZ, the fragmented Al 3 Ti particles are aligned and ...

Microstructural Evolution - an overview | ScienceDirect Topics

Thus, in order to correlate the mechanical response and the microstructures, the microstructural evolution in NiTi single crystals under the compression, tensile, and shearing tests is simulated by molecular dynamics (MD) in the current study. Then, the martensite variant identification method, which identifies the crystal variants/phases of ...

The analysis of superelasticity and microstructural ...

The microstructural evolution is investigated by means of electron backscattered diffraction and transmission Kikuchi diffraction. During HPT a grain fragmentation process takes place: within the original grains dislocations aggregate, resulting in the creation of very fine grains separated first by low and later by high angle grain boundaries.

Microstructural evolution study of severely deformed ...

A multiscale dislocation-based model was built to describe, for the first time, the microstructural evolution and strain-hardening of {332} 113 TWIP (twinning-induced plasticity) Ti alloys.

(PDF) Microstructural evolution and strain-hardening in ...

Microstructural evolution of strain rate related tensile elastic prestrain on the high-cycle fatigue in medium-carbon steel Article (PDF Available) · July 2019 with 97 Reads How we measure 'reads'

(PDF) Microstructural evolution of strain rate related ...

Accurately characterizing local strain, temperature, and microstructural evolution during, high strain-rate deformation is difficult due to the small scale and the rapid nature of shear. localization. Shear bands propagate between 250-1200m/s [44,46,48], and the most developed.

Microstructural Evolution during Heat Treatment and High ...

Microstructural evolution of thin section (3 nm) of polycrystalline Mg during uniaxial tensile stress loading at strain rate of 10 9 s⁻¹ at a time (strain) of (a) 48 ps (4.8%), (b) 52 ps (5.2% ...

Deformation Twinning in Polycrystalline Mg Microstructures ...

In this work, a high-temperature low-cycle fatigue (LCF) behavior of a newly developed austenitic oxide dispersion strengthened (ODS) steel is investigated. The LCF tests were performed in air at 650 °C under three different strain amplitudes (±0.4, ±0.5, and ±0.7%) with a nominal strain rate of 10⁻³ s⁻¹. The measured cyclic stress ...

High-temperature low-cycle fatigue behavior and ...

deformation. At low temperatures and high strain rates, dynamic strain aging did not have time to occur, so a decrease in strain hardening is observed. Microstructural analysis showed that recrystallization occurs with increasing test temperatures along initial grain boundaries and annealing twins. Recrystallization was especially prevalent at

Flow Behavior and Microstructural Evolution of INCOLOY 945 ...

Microstructural Evolution in Microalloyed Steels with High-Speed Thermomechanical Bar and Rod Rolling Robert Cryderman, Blake Whitely, and John Speer ... At high strains, strain rates, and temperatures recrystallization occurs dynamically (DRx) during the rolling pass. At lower strains, strain rates,

Microstructural Evolution in Microalloyed Steels with High ...

This study investigated the rheological and microstructural evolution of Carrara marble deformed to large shear strain to understand how dynamic recrystallization and lattice-preferred orientation (LPO) are related to strain softening processes. Solid cylinders of Carrara marble were deformed in torsion up to a shear strain of γ=11 at constant twist rates, which correspond to a shear strain ...

Rheological and microstructural evolution of Carrara ...

Microstructural evolution in deformation zones corresponded to the variation of tensile stress-strain characteristics with temperature, reflecting the hardening or softening feature of matrix. Dynamic recovery ascribed to the flow softening of the composite at 700 °C, while flow softening is owing to dynamic recovery and DRX above 800 °C.