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Evolution And High Strain Rate
Mechanical

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Microstructural Evolution And High Strain

The microstructural evolution and deformation mechanism of the 80 W-20Cu alloy at ultra-high strain rates under explosive loading were systematically investigated. During the deformation process, the W skeleton with high strength was fragmented into W particles, and the W particles were slightly elongated.

Microstructural evolution and deformation mechanism of the ...

In order to investigate the evolution of the microstructure with deformation, controlled strain tests have also been

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performed under high strain rate loading. The microstructural evolution (of texture, twins and dislocations) is then used to explain the observed mechanical behavior of the material.

Microstructural evolution of pure magnesium under high ...

To study the microstructural evolution in high-strain-rate shear deformation of Ti-5Al-5Mo-5V-1Cr-1Fe (Ti-55511) alloy, a series of forced shear tests of hat-shaped specimens have been conducted...

(PDF) Microstructural Evolution in High-Strain-Rate ...

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 ...

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Evolution of the microstructure suggests that under high strain-rate, both the dislocation slip and deformation twins contribute to the plastic strengthening of the copper specimen, resulting in ...

(PDF) Mechanical properties and microstructural evolutions ...

The microstructural analysis demonstrates that dislocation motion are main deformation 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)

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along...

(PDF) Dynamic tensile properties and microstructural ...

The present study focused on the microstructural evolution of the heat-treated 17-4 PH stainless steels and its correlation with the precipitation and dislocation induced strain hardening behavior. Based on the present study following conclusions can be drawn: (a)

Microstructural evolution and strain hardening behavior of ...

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

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nanotwinned steel under ...

A scaling law for describing the evolution with strain of the normalized effective microstructural length has been proposed, Eq. (4) . The evolution law (4) has three terms, the first term which promotes the reduction of δ (strain hardening) and is dominant in the very early stages of deformation and the second which inhibits the reduction of δ (strain softening) and is dominant at large strains.

Constitutive modeling of high-strain-rate deformation in ...

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-

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hardening in TWIP Ti ...

It was found that the evolution of microstructure and strain-hardening induced by plastic deformation were occurred in the subsurface. When the microstructure, hardness and depth of the plastic deformation layer (PDL) reached a relatively steady state, the friction process transformed into stable-state stage.

Microstructural evolution and dynamic strain-hardening in ...

Request PDF | Influence of Large Strain Hot Deformation on Microstructural Evolution in Alloy D9 | In this work, a Ti-modified austenitic stainless steel used in the core of fast reactors is ...

Influence of Large Strain Hot Deformation on ...

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

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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.

Microstructural evolution of TiC/near- α Ti composite ...

Examples of trans- and intercrystalline fatigue damage evolution in the low cycle, high cycle and ultrahigh cycle fatigue regimes in mono- and polycrystalline face-centred cubic and body-centred cubic metals and alloys and in different engineering materials are presented, and some microstructural models of fatigue crack initiation and early ...

Microstructural mechanisms of cyclic deformation, fatigue ...

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

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increasing test temperatures along initial grain boundaries and annealing twins. Recrystallization was especially prevalent at

Flow Behavior and Microstructural Evolution of INCOLOY 945 ...

Dynamic deformation behavior and microstructural evolution during high-speed rolling of Mg alloy having non-basal texture Article in Journal of Materials Science and Technology -Shenyang- 35(4 ...

Dynamic deformation behavior and microstructural evolution ...

during dynamic deformation under high strain rates has been a topic of great interest for decades and, thus, a ... the evolution of shear bands is dynamic and leads ... microstructural characterization, and micro-structural evolution. II. EXPERIMENTAL METHODS

Shear Localization in Dynamic Deformation: Microstructural ...

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By means of isothermal compression at temperatures in the range of 650–900 °C and strain rates in the range of 0.001–1 s⁻¹, the dynamic recrystallization behavior and microstructural evolution of a Cu-3.28Ni-0.6Si-0.22Zn-0.11Cr-0.04P (wt%) alloy designed by a machine learning method were investigated. A semiempirical constitutive equation, processing maps and an average ...

Dynamic recrystallization behavior and microstructure ...

A phase-field model coupling with elastoplastic deformation and creep damage has been built to study the microstructural evolution and deformation beh...

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