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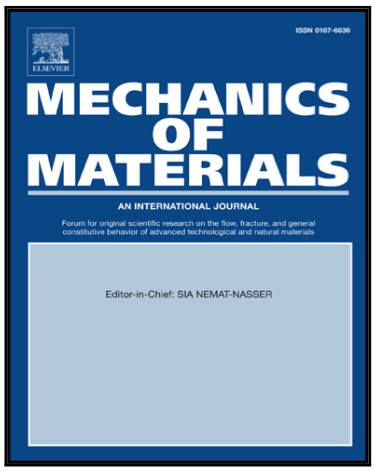


# Strain-rate dependence of mechanical behavior and deformation mechanisms in bimodal nanostructured Ni under micro-scratch testing

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**HIGHLIGHTS**

- In this paper, the micro-scratch technique that is a simple, convenient and reliable method was selected to provide continuous scratch hardness value over a wider range of strain rate (0.03 $s^{-1}$~30 $s^{-1}$) in a full dense, high purity and well-characterized electrodeposited NS Ni with bimodal grain size distribution.
- First, the strain rate varying with scratch speed was investigated. Second,the mechanical behaviors of the bimodal NS Ni sample were investigated carefully. Further, the strain-rate sensitivity exponents of the bimodal NS Ni were obtained by linear fitting under different scratch speed. Finally, the microscopic deformation mechanism in the bimodal NS Ni sample during scratch plastic deformation was discussed in details under different strain rates.

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