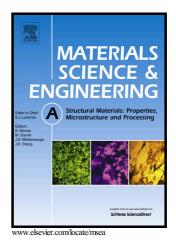
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Processing of ultrafine-grained titanium with high strength and good ductility by a combination of multiple forging and rolling

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Abstract

The microstructure and the mechanical properties of Grade 2 titanium semi-products processed by a combination of multiple-forging and subsequent plane rolling are studied. It is shown that the application of this technology on Grade 2 titanium doubled the strength without considerable deterioration of ductility at room temperature. The high strength is caused by the ultrafinegrained (UFG) microstructure with high dislocation density. The minimum grain size and the maximum dislocation density achieved by the combined method were very low (~560 nm) and high (~18 × 10¹⁴ m⁻²), respectively. Mechanical modelling suggests that the effectiveness of multiple forging in grain refinement is mainly caused by the large, homogeneous imposed strain Download English Version:

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