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**A novel ultra-high strength titanium alloy via hot deforming and subsequent  
low-pressure recrystallization annealing**

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**Abstract:**

Ultrafine grain with  $\{10\bar{1}1\}$  twinning forms in a novel close-packed hexagonal titanium (Ti) alloy processed by hot deforming and subsequent low-pressure recrystallization annealing. The novel recrystallization process with low-pressure and the lower stacking fault energy (SFE) caused by high alloying of Al and Zr are main reasons for the formation of twinning, and the nucleation of twinning is through packets of overlapping stacking faults in recrystallized grain. In addition, the ultra-high tensile strength of 1693MPa and the elongation of 5.4% are obtained.

**Key words:** Twinning; Titanium alloys; Mechanical properties

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