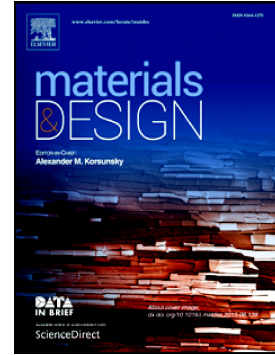


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Preparation of pure tungsten via various rolling methods and their influence on macro-texture and mechanical properties

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Abstract: It's necessary to investigate the texture characteristics of tungsten (W) to improve the functional properties and structural performance simultaneously. Rolling route is an important factor influencing texture evolution of metal. Thus W billets were deformed via unidirectional rolling (UNR), cross rolling (CRR) and clock rolling (CLR) respectively to figure out the effect of strain path on the evolution of microstructures, macro-textures and mechanical properties. The results indicated that the unidirectional rolled pure W exhibited moderate dynamic recrystallization level, pronounced θ -fiber texture and weak γ -fiber texture. Besides, the unidirectional rolled sample showed lower bending strength compared to the cross and clock rolled samples. Crack-tips and high texture level resulted in the low bending strength of the unidirectional rolled pure W. Summarily, to obtain more low crystallographic index texture components and high bending strength simultaneously, W can be deformed via UNR with moderate deformation degree but not CRR and CLR.

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