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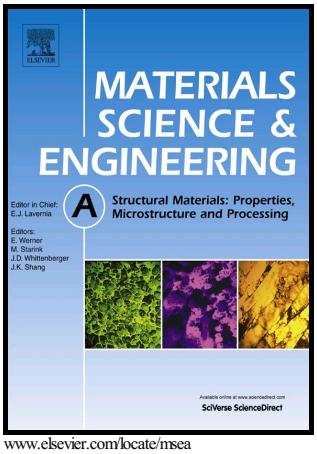


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# Misorientation Development in Continuous Dynamic Recrystallization of AZ31B Alloy Sheet and Polycrystal Plasticity Simulation

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## Abstract

A series of electron backscattered diffraction (EBSD) experiments is carried out to explore nucleation features in the continuous dynamic recrystallization (CDRX) of AZ31 Mg alloy sheets at 200°C. The CDRX mechanism that misorientation accumulated from the core area to grain boundary leads to nucleation of dynamic recrystallization grains around parent grains can be identified for the present fine-grained AZ31B Mg alloy rolling sheet. A crystal plasticity approach for DRX simulation is extended to simulate the hot deformation and CDRX of the AZ31B magnesium alloy sheets. The experimental results of uniaxial tension along rolling direction (RD) and compression tests along RD and normal direction of the AZ31B sheets at 200°C are numerically investigated by the current model in terms of mechanical behaviors, grains' rotation, textures orientation and grain sizes evolution. The VPSC-DRX model that considers multiple slip systems and indirectly incorporates the misorientation can reproduce well the stress-strain curves, r-values, grain size change and texture evolution. The introduction of DRX will change the slip mode activities at 200°C. The VPSC-DRX model can better predict the texture

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