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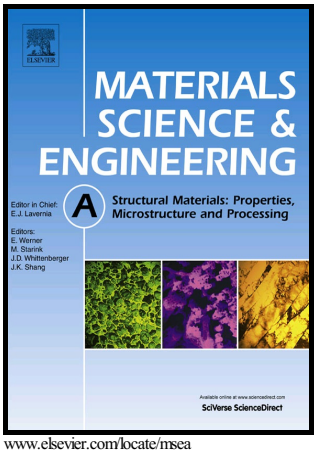

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Characterization of the hot deformation microstructure of AISI 321 austenitic stainless steel

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Abstract

In the present research, the hot deformation microstructure of AISI 321 austenitic stainless steel was studied by performing hot compression tests in the temperature range of 800-1200 ˚C and strain rates of 0.001-1 s^{-1}. Microstructural evolutions were studied using transmission and scanning electron microscope equipped with EBSD camera. Results show that the main restoration process in the temperature range of 800-950 ˚C is dynamic recovery and dynamic recrystallization is the prevailing softening mechanism in the temperature range of 1000-1200 ˚C. TEM observations confirm the occurrence of dynamic recovery and recrystallization at the specified temperatures. Increasing deformation temperature leads to the increase in the fraction of high angle boundaries and simultaneous decrease in the fraction of low angle boundaries. Also, deformation at 800 and 850 ˚C is accompanied by the formation of $M_{23}C_6$ precipitates at austenite grain boundaries that

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