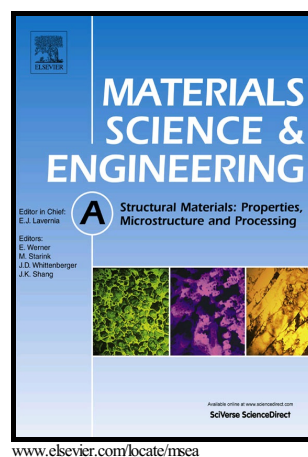


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Mechanical properties of an Fe-30Mn-4Si-2Al alloy after rolling at different temperatures ranging from 298-1073 K

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Abstract:

The microstructure evolution and associated changes of mechanical properties in an Fe-30Mn-4Si-2Al TRIP/TWIP steel subjected to rolling over a wide temperature range of 298-1073 K were studied. The extensive ϵ -martensite subdivides the initial coarse grains into nanoscale lamella structure after rolling at 298 K, with a high dislocation density. The elevating of rolling temperature changed the deformation microstructure from ϵ -martensite to deformation twins, as well as a decrease in dislocation density. The main emphasis is on the contribution of different plastic deformation mechanisms involved in the strengthening. Both ϵ -martensite and deformation twins have an impact on the strengthening by bringing about a Hall & Petch effect. However,

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