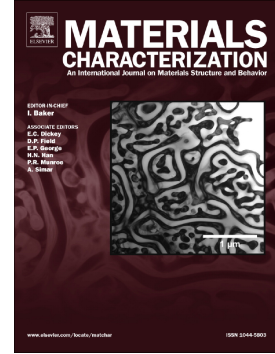


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The surprising influence of continuous alternating electric current on recrystallization behaviour of a cold-rolled Aluminium alloy

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Abstract

Pronounced acceleration of recrystallization in cold worked metals is generally observed during annealing with additional high density electric current pulses. In this work, continuous alternating current of low density was applied to heat cold-rolled samples in a Gleeble machine. The recrystallization behaviour of these samples is compared with those heated in a conventional furnace using the same temperature-time path. It is shown for the first time that strongly accelerated recrystallization can also be achieved with low density alternating electric current. This effect is sensitive to prior cold-deformation and current direction, which provides new degrees of freedom for thermo-mechanical process design and microstructure control.

Keywords: Continuous alternating electric current; Recrystallization kinetics; Annealing; Microstructure; Aluminium alloy

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