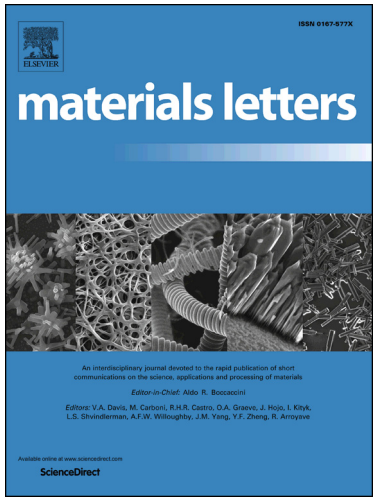

Varying the strong basal texture in a Mg-3Al-1Zn plate by a new wave-shaped interface rolling

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Varying the strong basal texture in a Mg-3Al-1Zn plate by a new wave-shaped interface rolling

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Abstract: In this study, a new rolling method, wave-shaped interface rolling (WIR), was proposed to tailor the strong basal texture of a hot-rolled Mg AZ31 plate. Microstructure and texture of the WIRed and annealed plate were investigated and the mechanism for texture variation was discussed. The results show that the waved interface can effectively rotate the basal poles away from the normal direction toward the rolling direction at both the regions near and far from the waved interface. Different inclination angles of <0002> away from the normal direction occur at different regions in the rolled plates and a maximum inclination around 30° can be obtained.

Key words: Mg alloy; texture; rolling; interface; asymmetric deformation

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1. Introduction

As the lightest metal structural materials, magnesium alloys have many applications in automobile and aerospace industries which hunt for an effective weight-saving [1, 2]. However, the strong basal texture developed during hot rolling often leads to a poor cold working ability of the Mg plate [3]. Various methods have