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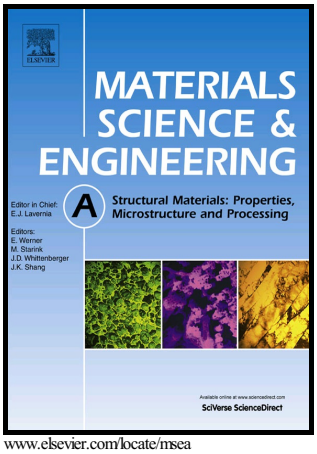

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A special band structure perpendicular to the basal planes formed in a magnesium alloy during hot-rolling process

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Abstract

Special band structures were observed in original matrix of AZ31 alloy during hot-rolling process. They were always perpendicular to basal planes, formed by intersecting of $\vec{a}+\vec{c}$ slip on prismatic plane with basal dislocations. The misorientation gradient was much higher across band area than locally inside. Such bands showed straight morphology at low rolling strain range, which effectively strengthened the material by reducing the mean free path of slipping dislocations on basal plane in original matrix, without evident loss in ductility. On further strain, the bands structures became more severely deformed, which lead to a gradual increase in strength and a quick drop in ductility.

Keywords: Magnesium alloy; Band structure; Rolling;

1. Introduction

One of the most important factors to limit the widespread application of