

研究论文

Ta--7.5%W合金箔材的冷轧变形织构与微观结构

王珊, 汪明朴, 陈畅, 夏福中, 杨巧然

中南大学材料科学与工程学院 长沙 410083

摘要: 研究了140 μm的Ta--7.5%W合金箔材在冷轧变形前后的织构和微观组织, 结果表明: 冷轧态和退火态的Ta--7.5%W合金箔材中主要形成了{001}<110>、{113}<110>、{112}<110>、{111}<110>四种织构组分; 在冷轧的Ta--7.5%W合金箔材中, 合金的{100}<110>取向和{113}<110>取向的晶粒中都形成了位错胞结构, 且在{100}<110>方向上主要为大的等轴状位错胞结构, 位错胞的平均大小在500 nm左右, 而在{111}<110>取向形成了微带组织, 这些微带互相平行, 微带之间的平均间距在200 nm左右; 微带主要由GNBs(geometrically necessary boundaries, 几何必须位错界面)和IDBs(incidental dislocation boundaries, 附生位错界面)两种位错界面结构组成, GNBs中含有一组相互平行的高密度位错, 位错之间的间距在5 nm左右。

关键词: 金属材料 冷轧 Ta--W合金 织构 变形组织

The Microstructures and Textures of the Cold - rolled Ta - 7.5% W Alloy Foils

WANG Shan, WANG Mingpu, CHEN Chang, XIA Fuzhong, YANG Qiaoran

School of Material Science and Engineering, Central South University, Changsha 410083

Abstract: The microstructure and texture in both the annealing and cold - rolled conditions of 140 μm Ta - 7.5%W alloy foils were investigated by TEM and orientation distribution function (ODF) analysis. It is found that the main texture components of the annealing and cold - rolled Ta - 7.5%W alloys are {001}<110>, {113}<110>, {112}<110> and {111}<110>. In the cold - rolled Ta - 7.5%W alloy foils, the dislocation cell structures were formed in both {001}<110> and {113}<110> orientations. There were a lot of equiaxed cell structures with an average size of 500 nm in the grains of {001}<110> texture. The microband structures were developed in the {111}<110> grains, which are distributed parallelly in the grains with a mean space length of 200 nm. The microbands consist of GNBs and IDBs. In the GNBs, there were a set of high density parallel dislocations with the spacing of about 5 nm.

Keywords: metallic materials cold - rolled Ta - W alloy textures deformation structures

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通讯作者: 汪明朴

作者简介:

通讯作者E-mail: wangmp@mail.csu.edu.cn

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