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微量元素对高纯铝箔立方织构的影响

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摘要: 采用晶体取向分布函数(ODF)研究和分析了在高纯铝中分别加入不同含量的微量稀土或铍对成品高纯铝箔立方织构的影响。研究表明: 添加微量稀土和铍, 能改变高纯铝箔变形织构组分含量, 单独加稀土时, 织构变化不大; 在单独加铍时, 其S取向{123}<634>和Cu取向{112}<111>变化较大, 随铍含量增加, 其S取向密度 $f(g)$ 减少, Bs{110}<112>取向密度增加。再结晶退火后, 随稀土加入量增加, 立方织构{100}<001>取向密度增加, R织构{124}<211>取向密度减少; 铍添加较少时能增加成品箔材中立方织构{100}<001>强度, 但随铍含量增加, 立方织构含量急剧减少, R织构强度相应增加。稀土和铍在铝中溶解度都极小, 与铁等微量杂质元素可能形成化合物析出后, 能净化基体, 减小铁对形成立方织构的阻碍作用, 促进再结晶立方取向核心的形成与长大, 增加立方织构比例。

关键字: 高纯铝箔; 立方织构; 变形织构; 稀土; 铍

Effect of trace elements on cube texture of high-purity aluminum foils

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Abstract: The effect of trace elements(Be and Y) on cube texture of high-purity aluminum foils was investigated by means of orientation distribution functions (ODF). The results show that trace elements can change the deformation textures of high purity aluminium. The rare earth Y has a little influence on deformation textures. But Be affects them strongly. The S texture decreased and the Bs texture increased with the increment of Be. And a small addition of Be and Y to high-purity aluminum brought about a considerable increment of the cube texture. And it reduced the content of R texture. The trace elements can combine with the other impurities to form metallic compounds. When the precipitation of these particles in the matrix is nearly completed and the Fe concentration in the matrix becomes low, the cube texture can develop well and the R texture can be suppressed.

Key words: high-purity aluminium foils; cube texture; deformation texture; rare earth; beryllium

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