

论文

非同轴取向Cu三晶体及双晶体的循环形变行为比较

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摘要: 采用逐级增幅方式研究了Cu三晶及双晶试样的循环硬化及饱和行为实验结果表明,对于组元晶粒均为单滑移取向的倾斜晶界双晶试样,其循环应力应变曲线(CSSC)存在平台或准平台区域,而三晶试样的CSSC无平台区出现表面滑移形貌观察表明,由于应变不相容性,在低应变幅下,三晶交点处对各晶粒的主滑移有明显的阻碍作用由于存在较强的晶界几何约束,在相同应变幅下,三晶交点处的形变量较双晶晶界处小同一三晶交点,外载方向不同,裂纹萌生难易差别很大

关键词: Cu三晶体 三晶交点 循环形变 塑性不相容性

COMPARISON BETWEEN CYCLIC DEFORMATION BEHAVIORS OF NON-ISOAXIAL COPPER TRICRYSTAL AND BICRYSTAL

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Abstract: The cyclic hardening and saturation behaviors of copper tricrystal and bicrystal were investigated by using successively increasing amplitude method. The results show that, to the inclined grain boundary bicrystal with single slip components, the cyclic stress strain curve (CSSC) ealsts a plateau or quasi-plateau region, while the CSSC of tricrystal shows no plateau.Observation of surface morphologies indicated that owing to the strain incompatibility of three grains, at lower strain amplitude the triple junction retards obviously the primary slip in grains and makes deformation near it smaller than that near bicrystal junction. The eastness of crack initiation at the same triple junction is closely related to loading direction.

Keywords: copper tricrystal triple junction cyclic deformation plastic strain incompatibility

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