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TiAl合金PST晶体中Ti₃Al片层取向对其蠕变性能的影响

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EFFECT OF Ti₃Al LAMELLAR ORIENTATION ON THE CREEP BEHAVIOR OF TiAl PST CRYSTAL

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摘要

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摘要 对2种硬取向(φ=90°和0°, φ为外力轴与片层界面的夹角)的TiAl合金PST晶体试样的高温压缩性能及蠕变性能进行了测试,并对其蠕变组织进行了观察。结果表明:2种取向试样的屈服强度及蠕变性能存在明显的差异;在T=800℃,σ=350MPa蠕变条件下,φ=90°试样过早出现蠕变失稳阶段,这与该取向试样片层组织中α₂相在蠕变过程中发生球化及剪切带的形成有关。

关键词:

Abstract: The yield strength and creep curves of TiAl PST crystals with two 'hard' orientations(i.e., φ=90° and 0°, φ is the angle between loading axis and lamellar boundaries) at high temperature have been measured and compared, and the deformation structures of the crept samples have been examined by using SEM and TEM. The results indicated that the yield strength and creep behavior were quite different between these two oriented samples; Under the condition of T=800℃ and σ=350MPa, the earlier onset of tertiary creep was found in the sample with φ=90°, which may be caused by the spheroidization of α₂ phase and the formation of shear band during creep.

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