

论文摘要

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磷含量对IN718合金持久和蠕变性能的影响

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摘要: 研究了不同含量的磷在IN718合金中的作用。结果表明, 磷对持久和蠕变性能有显著的影响, 可提高IN718合金晶界抗蠕变开裂的能力。将磷含量由0.003%提高至0.03%, 持久寿命先是增加而后降低, 并在含磷0.025%处达到持久寿命峰值。磷对应力指数影响不大, 但对表面蠕变激活能影响显著。磷的有益作用主要来自于抑制晶界扩散和改善晶界 δ 相。

关键字: IN718合金; 磷; 晶界; 扩散; 持久性能; 蠕变

Effects of phosphorus content on stress rupture and creep properties of IN718

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Abstract: The effect of phosphorus on IN718 alloy was studied. The results showed that phosphorus can significantly affect the stress rupture properties. With increasing content of phosphorus from 0.003% to 0.03%, the stress rupture life increases firstly and then decreases and reaches the peak value at 0.025%. Phosphorus does not appear to modify the stress exponent but influences the apparent activation energy for creep markedly. The beneficial effects of phosphorus mainly arise from the suppression of diffusion along grain boundary and the improvement of grain boundary δ phase.

Key words: IN718 alloy; phosphorus; grain boundaries; diffusion; stress-rupture test; creep

