

论文

定向凝固Ti-(44~54)at%Al包晶合金相选择

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摘要:

通过对Ti-(44%-54%)Al合金(原子分数)在较大的温度梯度与生长速率比值(G/v)范围内进行Bridgman定向凝固实验, 研究了不同凝固条件下的固/液界面形态演化规律、包晶两相组织的形成规律及最终形成的片层结构的取向规律. 采用充分形核假设及成分过冷判据, 计算了不同成分Ti-Al合金相与组织随凝固参数演化的相选择图, 计算结果与实验结果符合较好.

关键词: Ti-Al合金 定向凝固 相选择

SOLIDIFICATION PHASE SELECTION IN DIRECTION-ALLY SOLIDIFIED Ti-(44%—54%)Al ALLOYS

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Abstract:

Directional solidification experiments were conducted for Ti-(44%—54%)Al (atomic fraction) alloys in a wide range of ratios between temperature gradients and growth rates. Interfacial morphology evolution, microstructure formation and the final lamellar orientations were investigated under different solidification conditions. Nucleation and compositional undercooling criterion were used to calculate the phase selection map for Ti-Al alloys which gives phases and corresponding microstructures at different initial compositions and solidification parameters. The map is in good agreement with the experimental results and gives important criteria for determining phase compositions and solidification parameters in lamellar orientation control of Ti-Al alloys.

Keywords: Ti-Al alloy directional solidification phase selection

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