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论文

原位TiC_P对近液相线铸造7075铝合金二次加热组织的影响

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摘要：

采用原位反应近液相线铸造方法制备4. 4 %TiC_P/7075 铝复合材料，在基体合金的液-固两相区间(477～635 ℃)的600℃ 分别保温 10、20、40、60 min，水淬固定其半固态组织，应用 Image Pro Plus软件测量平均晶粒尺寸，研究原位TiC_P对二次加热组织的影响。结果表明，原位TiC_P不仅使合金铸态组织直接转变为等轴晶组织，而且在二次加热过程中，对晶粒的长大行为具有明显的抑制作用。在相同的二次加热条件下，TiC_P/7075铝复合材料的平均晶粒尺寸比 7075基体合金减小了 30～40μm，更适合于半固态触变成形。

关键词： 近液相线铸造 原位 TiC颗粒 二次加热 7075铝合金

Effect of in-situ TiC particle on reheating microstructure of near-liquidus casting 7075A1 alloys

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Abstract:

The 4. 4 %TiC_P/7075 matrix composite was prepared by in-situ reactive near-liquidus casting. The sectioned specimens were heat-treated isothermally at 600℃ between the two-phase (liquid-solid) region (477～ 635℃) of the near-liquidus cast 7075 alloy for 10, 20, 40 and 60 min, then quenched in water. The grain size was measured using the software Image Pro Plus and the effect of in-situ TiC_P on the reheating structure was analyzed. The result shows that the in-situ TiC_P with fine and globular can not only keep near-liquidus cast 7075 alloy microstructure, but also cont rol evidently grains growth by pinning effect during reheating. Dealing under the same condition , the grain sizes of TiC_P/7075 matrix composites are 30～40 μm less than those of 7075 alloy, which is very suitable for thixoforming.

Keywords: near liquidus casting in-situ TiC particle reheating 7075Al alloy

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