

论文摘要

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添加合金元素对改善快速凝固铝锂合金性能的作用

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摘要: 通过研制Al-2.5Li, Al-2.5Li-0.2Zr, Al-2.5Li-1.2Mg-0.2Zr, Al-2.5Li-1.6Cu-1.2Mg-0.2Zr 4种成分的快速凝固铝锂合金, 研究了逐步添加合金元素Zr, Mg, Cu对合金力学性能的影响。结果表明: 在快速凝固铝锂合金中逐步加入少量合金元素Zr, Mg, Cu后, 合金强度逐步增加, 而延伸率无明显变化, 这有助于强化合金基体和阻碍合金基体的剪切型断裂, 有助于改善合金的综合力学性能, 其中Al-2.5Li-1.6Cu-1.2Mg-0.2Zr合金综合力学性能最优, 其密度、强度、塑性等都全面达到了国家高技术项目的技术指标。

关键字: 快速凝固铝锂合金; 合金元素

Effects of alloying elements on improving properties of rapidly solidified aluminum lithium alloy

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Abstract: Through preparing rapidly solidified Al-Li alloys with the composition of Al-2.5Li, Al-2.5Li-0.2Zr, Al-2.5Li-1.2Mg-0.2Zr and Al-2.5Li-1.6Cu-1.2Mg-0.2Zr, the effects of progressive addition of Zr, Mg, Cu on the mechanical properties of the alloys were investigated. The results show that after adding some alloying elements Zr, Mg, Cu in the rapidly solidified Al-Li alloy, the strength increases and the elongation does not change significantly. The alloying elements Zr, Mg and Cu strengthen the matrix of alloys, hinder the crack of the shearing type and improve mechanical properties. Among the investigated alloys the mechanical properties of the Al-2.5Li-1.6Cu-1.2Mg-0.2Zr alloy are the best, and its density, strength and plasticity reach the technical target made by National High-tech Committee.

Key words: rapidly solidified aluminum lithium alloy; alloying element

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