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Cr在Ti-Al-Cr合金抗高温氧化过程中的作用研究

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MECHANISM OF Cr EFFECT FOR IMPROVEMENT OF OXIDATION RESISTANCE OF Ti-Al-Cr ALLOYS

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摘要 | 参考文献 | 相关文章

摘要 研究了 Ti-50 Al,Ti-50 Al-1 5Cr,Ti-4 5Al-1 5Cr和 Ti-67Al-8Cr(原子百分数)合金在 900～1000℃下的高温氧化性能。结果表明 :Ti-50 Al-1 5Cr,Ti-4 5Al-1 5Cr和 Ti-67Al-8Cr均表现出优良的抗氧化性能,氧化后表面主要是 α-Al_2O_3及少量的 TiO_2 组成。Ti-50 Al-1 5Cr,Ti-67Al-8Cr和 Ti-4 5Al-1 5Cr合金良好的抗高温氧化性能归于 Cr在合金抗氧化过程中起到了吸氧效应的作用。另外发现对于 Ti-50 Al-1 5Cr和 Ti-67Al-8Cr均发生了 950℃时的氧化增重比 1000℃时的氧化增重大,这是由于 Cr的加入使 Ti的活性降低的缘故。

关键词： Ti-Al-Cr 高温氧化 Cr的作用 TiAl

Abstract： The high temperature oxidized behavior of Ti-50Al, Ti-50Al-15Cr, Ti-45Al-15Cr and Ti-67Al-8Cr(at.%) alloy at 900~1000℃ was studied. The results showed that Ti-50Al-15Cr, Ti-45Al 15Cr and Ti-67Al-8Cr have good oxidation resistance. The weight gain at 950℃ for Ti 50Al 15Cr and Ti 67Al 8Cr is more than that at 1000℃, which is due to a decrease in titanium activity in Ti-Al-Cr alloys when Cr is added into Ti-Al alloys. Oxides formed on the surface of Ti-50Al-15Cr, Ti-45Al-15Cr and Ti-67Al-8Cr after oxidation consist of α Al_2O_3 and tiny TiO_2. The formation of Al_2O_3 is attributed to the role of Cr. Effect of Cr can be described by ‘gettering effect’.

Keywords： T i-A l-Cr h igh temperature oxidat ion effect of Cr T iA l

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