

论文

K4104合金渗Al-Si涂层抗高温氧化性能研究

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摘要:

采用无机盐料浆法,在K4104镍基高温合金表面制备Al-Si涂层。通过改变粘结剂中CrO3的含量得到两种不同成分的Al-Si涂层。依据HB5258-2000标准,对制备了Al-Si涂层的K4104镍基高温合金进行了高温氧化性能试验。绘制了氧化动力学曲线,用带能谱分析的扫描电镜观察了涂层的表面氧化形貌和截面组织形貌。结果表明,K4104镍基高温合金表面的Al-Si涂层在高温氧化过程中已转变成完整致密的 α -Al₂O₃氧化层和 β -NiAl相化合物层,且与基体合金的粘附性良好,说明Al-Si涂层具有优良的抗高温氧化性能。

关键词: K4104镍基高温合金 Al-Si涂层 高温氧化

Study on high temperature oxidation resistance of Al-Si coating on K4104 Superalloy

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Abstract:

The Al-Si coating on the surface of K4104 superalloy were prepared by using slurry process. Two different coating were formed by changing the CrO3 content of agglomerant. According to HB5258-2000, the high temperature performance of these coating have been investigated by high temperature oxidation test. The oxidation kinetics curve was drawn. The surface morphology of the Al-Si coating were studied by using SEM. The results indicate that the Al-Si coating on the surface of K4104 superalloy have transformed to compact oxidized film α -Al₂O₃ and β -NiAl compound scale in the process of high temperature oxidation and all of them have good adhesivity. The Al-Si coatings have excellent high temperature oxidation resistance.

Keywords: K4104 superalloy Al-Si coating high temperature oxidation

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