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Al 量对 Ni-Al-Hf-Cr-W 系合金显微组织结构的影响

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EFFECT OF Al CONTENT ON MICROSTRUCTURE OF Ni Al Hf Cr W SYSTEM ALLOYS

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摘要

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摘要

研究了Ni-20Hf-8Cr-8W- (4~6) Al系列合金的显微组织以及Al含量对共晶组织的影响, 结果表明: 此系列合金中, 随着Al含量的微小变化, 会析出不同的共晶组织; 当Al含量大于5.5wt%时, 出现 (β -NiAl+Ni7Hf2) 或 (γ' + β -NiAl+Ni7Hf2) 共晶; 当Al量小于5.5wt%时, 会出现 (γ' +Ni7Hf2)、(γ + γ' +Ni7Hf2) 或 (γ +Ni7Hf2) 共晶组织。并且得出 (Ni-20Hf-8Cr-8W-5.3Al) wt%的合金具有 (γ' +Ni7Hf2) 共晶, 适宜选做为以Ni7Hf2增强的共晶复合材料的合金成份。

关键词: Ni-Al-Hf-Cr-W合金 共晶复合材料 Ni7Hf2相 共晶 微观结构

Abstract:

The microstructural characterizations of Ni (4~6)Al 20Hf 8Cr 8W system alloys have been examined by optical micrograph, TEM, SEM, Electron Microprobe and X ray diffraction. In particular, the influence of aluminium content was studied in detail. A slight difference of the aluminum content can change obviously the microstructure and bring about eutectic phases. The γ' +Ni 7Hf 2, γ + γ' +Ni 7Hf 2 or γ +Ni 7Hf 2 eutectic was present in low Al content alloys (<5.5wt%), and the β +Ni 7Hf 2 or γ + β NiAl+Ni 7Hf 2 eutectic in high content alloys(>5.5 wt%). Ni 5.3Al 20Hf 8Cr 8W is the proper composition as the γ' /Ni 7Hf 2 eutectic composite materials.

Keywords: Ni Al Hf Cr W alloys in situ composite material Ni 7Hf 2phase eutectic microstructure

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