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TiNiPd高温形状记忆合金相变温度与相变滞后的研究

徐惠彬, 蒋成保, 宫声凯

北京航空航天大学材料科学与工程系 北京 100083

PHASE TRANSFORMATION TEMPERATURES AND HYSTERESIS IN TiNiPd HIGH TEMPERATURE SHAPE MEMORY ALLOY

XU Hui-bin, JIANG Cheng-bao, GONG Sheng-kai

Department of Materials Science and Engineering, Beijing University of Aeronautics and Astronautics, Beijing 100083, China)

摘要

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摘要 回顾了 Ti Ni 二元系合金基础上发展起来的 Ti Ni-X 三元系高温形状记忆合金及 Ni Al 系高温形状记忆合金。重点研究了 Ti Ni Pd 系合金成分、相变温度和相变滞后的关系。结果表明:当 Pd 的原子百分数大于 33%,相变点的增加尤为显著,Pd 的原子百分数提高 1%,将导致合金的相变温度升高 20℃,当 Pd 的原子百分数为 40% 时,Ms 点可达 379.8℃。温度滞后 ΔT 随 Pd 含量的增加基本不变,只是在 Pd 原子百分数达到 40% 时 ΔT 略有增加。相变热 ΔH 随 Pd 含量增大呈线性增加,非常明显

关键词: TiNiPd 高温记忆合金 相变

Abstract: This paper has reviewed NiTi based ternary NiTi X and binary NiAl high temperature shape memory alloys. The emphasis was laid on studying the relation between chemical composition, phase transformation temperatures and transformation hysteresis. It is indicated that the transformation temperatures increased evidently with increasing Pd content, especially when the alloy containing more than 33at% Pd. Every 1at% more Pd content addition led to an effect of about 20℃ increment of transformation temperature. An alloy with 40at% Pd can reach a transformation temperature of 379.8℃. The temperature hysteresis remained nearly constant and the latent heat enlarged linearly with Pd content increment.

Keywords: TiNiPd high temperature shape memory alloys phase transformation

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