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论文

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Ti-51.8at%Ni形状记忆合金中Ti₃Ni₄相的析出过程

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PRECIPITATION PROCESS OF Ti₃Ni₄ PHASE IN Ti-51.8at%Ni SHAPE MEMORY ALLOY

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摘要

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摘要 用透射电镜系统地研究了Ti-51.8at%Ni形状记忆合金在300~600℃时效时Ti₃Ni₄相的析出过程。结果表明:Ti₃Ni₄相以均匀成核方式从过饱和基体中弥散析出。时效初期,Ti₃Ni₄相为细小颗粒状;随时效时间延长或时效温度升高,Ti₃Ni₄相逐渐长大为透镜片状,最终粗化为粗片状。Ti₃Ni₄相通常与基体保持良好的共格关系,其共格应变场衬度随Ti₃Ni₄相尺寸增大而变化,至Ti₃Ni₄相聚集粗化后,与基体的共格关系逐渐丧失,并在其周围基体中产生位错,位错的柏氏矢量为1/2(111)_{B2}或1/2(111)_{B2}。

关键词: Ti₃Ni₄相 应变场衬度 TiNi合金

Abstract: The precipitation processes of Ti₃Ni₄ phase in Ti-51.8at% Ni alloy aged at 300 ~ 600℃ have been systematically studied by means of transmission electron microscope. It is found that the Ti₃Ni₄ precipitates nucleate homogeneously at the early stage of aging and appear as fine dispersed particles. Upon the prolongation of aging time or temperature, the Ti₃Ni₄ precipitates become gradually the lenticular-like shape, and finally exhibit coarse plates. They are in good Coherence with the matrix. The contrast of the internal strain fields caused by the coherent Ti₃Ni₄ precipitates changes with their growth. When the Ti₃Ni₄ precipitates are coarsened enough, they lost in coherence with the matrix and produce dislocations about them. The Bagle's vectors for these dislocations are determined to be 1 / 2 [111]B₂ or 1 / 2 [111]B₂.

Keywords: Ti₃Ni₄ phase strain field contrast TiNi alloy

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