

### 论文摘要

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## 热循环对不同相变温度CuZnAl形状记忆合金性能的影响

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**摘要:** 研究了预应变、热处理工艺和循环介质对不同相变温度CuZnAl形状记忆合金形状记忆效应的影响。结果表明: 尽管预应变、热处理工艺及训练介质均不同, 但回复率均随循环次数的增加先上升而后下降, 相变温度(361 K以上)高的合金回复率偏低; 随着冷热循环训练次数的增加, 合金的马氏体转变开始温度( $M_s$ )和奥氏体转变结束温度( $A_f$ )均有所提高, 其 $M_f$ 和 $A_s$ 均有所降低; 经过热循环之后, 相变温度(361 K以上)高的合金的相变温度的幅度提高较大, 且具有较大的热滞。

**关键字:** CuZnAl 形状记忆合金; 预应变; 相变温度; 记忆效应; 冷热循环; 热处理工艺

## Effect of thermal cycling on properties of CuZnAl shape memory alloys with different transformation temperatures

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**Abstract:** The effects of different pre-strains, heat treatments and mediums on the shape memory effect of CuZnAl alloys with different transformation temperatures were studied. The results show that the recovery rate increases firstly, then decreases with increasing cycling number, although the pre-strain, heat treatment and medium vary, respectively. The recovery rate is relatively low when the transformation temperature is higher than 361 K. The Martensite transformation starting temperature  $M_s$  and Austenite transformation finish temperature  $A_f$  increase with increasing cycling number. But both  $M_f$  and  $A_s$  decline. After thermal cycling, for the alloy with high transformation temperature (above 361K), the range of transformation temperature is enlarged, and the thermal hysteresis is large.

**Key words:** CuZnAl shape memory alloys; pre-strain; transformation temperature; shape memory effect; thermal cycling; heat treatment process

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