

Characteristic evaluation of Shape Memory effect of Copper-Manganese-Aluminum (CuMnAl) Alloy

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Abstract

The growing interest in Cu-based shape memory alloys is significant today. Most of the research has been done on Ni-based shape-memory alloys and across the variety of classes, since Cu-based shape-memory alloys have the ability to be fabricated very easily by induction melting are available at low cost and possess very good mechanical stability. The importance of inclusion of Manganese in Cu based shape memory alloys, which states that the improvement in manganese leads to high working temperature conditions for shape memory alloy [8]. So, in the present study an attempt is made with further improvement in the manganese content by careful study in order to produce a very high temperature SMA with the composition of CuMn₁₃Al₇. Structural analysis on the test samples are performed by X-ray diffraction, DSC and Pseudo Elastic effect. The shape memory ratio, recoverable strains are tested and these two are the two main design parameters for the SMA application. In this paper the shape memory effect is presented. Developed shape memory alloy can be used for actuator applications over a large number of thermal cycles.

Keywords

XRD, DSC, Shape Memory, CuMnAl Alloy.