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# Martensitic transformation in freestanding and supported Cu-Al-Ni thin films obtained at low deposition temperatures

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In order to use the shape memory alloy Cu-Al-Ni in micro-actuators, freestanding thin films with martensitic transformation are required. Here we show that freestanding Cu-Al-Ni thin films with $L2_1$ structure and martensitic transformation and shape memory effect can be obtained using iron as a sacrificial layer. The Cu-Al-Ni films with best performance are obtained at deposition temperatures between 533 K and 563 K. The Fe layer can afterwards be removed selectively by electrochemical etching.

Keywords: thin films; microstructure; shape memory.
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## 1. Introduction

Low dimensional systems based on shape memory alloys (SMA) have potential applications for micro-scale sensors and actuators [1]. Copper based alloys are particularly useful for applications in cases in which biocompatibility is not required and low-cost devices can be designed for specific purposes. Cu–Al–Ni SMA have some particular characteristics such as high thermal stability [2], broad range of martensitic transformation

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