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## New type of Schottky diode-based Cu-Al-Mn-Cr shape memory material films

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### Abstract

Cr-doped CuAlMn shape memory alloys were produced by arc melting method. The effects of Cr content on microstructure and transformation parameters of were investigated. The alloys were characterized by X-ray analysis, optical microscope observations and differential scanning calorimetry measurements. The grain size of the alloys was decreased by the addition of Cr into CuAlMn alloy system. The martensite transformation temperature was shifted both the lower temperature and higher temperature with the addition of chromium. This change was explained on the basis of the change in the thermodynamics such as enthalpy, entropy and activation energy values. The obtained results indicate that the phase transformation temperatures of the CuAlMn alloy system can be controlled by addition of Cr. We fabricated a Schottky barrier diode and observed that ideality factor and barrier height increase with increasing temperature. The diodes exhibited a thermal sensor behavior. This indicates that Schottky diode-based Cu-Al-Mn-Cr shape memory material films can be used as a sensor in high-temperature measurement applications.

### Keywords

**KeyWords Plus:** [CURRENT-VOLTAGE CHARACTERISTICS](#); [HIGH RECTIFICATION RATIO](#); [BARRIER DIODES](#); [MARTENSITIC-TRANSFORMATION](#); [MECHANICAL-PROPERTIES](#); [THERMAL-STABILITY](#); [ALLOYS](#); [MICROSTRUCTURE](#); [CAPACITANCE](#); [TI](#)

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