

PO1039

**Electrical properties and thermal stability of Mg<sub>2</sub>Si co sputter deposited coatings**Alain Billard<sup>1</sup>, Mohammad Arab Pour Yazdi<sup>2</sup>, Nicolas Martin<sup>3</sup><sup>1</sup>utbm, belfort, France <sup>2</sup>UTBM, Belfort, France <sup>3</sup>Femto-ST, Besancon, France

alain.billard@utbm.fr

Recent works showed that Mg<sub>2</sub>X (X = Si, Sn, Ge) are potential interesting candidates as n- or p-type thermoelectric materials depending on the nature of X.

In this paper, we investigate the deposition of about 5 μm thick Mg<sub>1-x</sub>Si<sub>x</sub> (0 < x < 1) coatings by co-sputtering in pure Ar atmosphere of Mg and Si targets by maintaining constant the total power dissipated on both targets. In these experiments, the substrate holder is rotating at a sufficient rotation speed to ensure the deposition of alloy coatings. The structural and morphological features of the amorphous as-deposited coatings are then investigated as a function of the annealing temperature under vacuum and their electrical properties are determined in the amorphous and crystallized states by means of both four-point and Hall probes measurements.

Finally, the thermal stability of crystallized coatings is investigated by annealing treatments performed in air at temperatures up to 500°C followed by X-Ray diffraction and electrical measurements to determine the oxidation resistance of those coatings and its influence on their conduction properties.

**Keywords**

Mg-Si

co-sputtering

electric properties

hall measurements

thermal stability