

ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

ΠΑΡΟΥΣΙΑΣΗ ΜΕΤΑΠΤΥΧΙΑΚΟΥ ΔΙΠΛΩΜΑΤΟΣ ΕΙΔΙΚΕΥΣΗΣ

Τίτλος:

**«*Metal oxides for magnetotransport and thermoelectric
applications*»**

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ΠΕΡΙΛΗΨΗ

Metal oxides have been considered as possible candidates for magnetotransport applications. Oxides are low cost materials, non-toxic and very stable in extreme environmental conditions. Moreover, there are oxides that exhibit very good magnetotransport properties. However, the formation of them in thin films requires high temperatures which are not compatible with the current semiconductor technology. Moreover, the presence of the substrate and the background gas pressure affects directly the magnetotransport properties of the material.

On the other hand, there are oxides which are efficient candidates for thermoelectric devices, due to the advantages listed above. The thermoelectric performance of an oxide can be affected by several parameters, which are needed to be investigated in detail. In several cases a combination of several materials is used, to make a thermoelectric device with thermoelectric performance high enough for real uses for cooling or power generation.

In this thesis, the magnetite Fe_3O_4 is studied for magnetotransport applications and the $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ solid solution is investigated as a possible thermoelectric oxide. Finally, a simple planar thermoelectric thin film structure is proposed for applications with enhanced thermoelectric performance.

Ο Πρόεδρος του Τμήματος

N. Πελεκάνος