

**ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ**

ΠΑΡΟΥΣΙΑΣΗ ΜΕΤΑΠΤΥΧΙΑΚΟΥ ΔΙΠΛΩΜΑΤΟΣ ΕΙΔΙΚΕΥΣΗΣ

Τίτλος

«Study of anode and cathode materials suspensions towards printed solid oxide fuel cells»

Λέιλα Ζουρίδη

Μεταπτυχιακή Φοιτήτρια

Τμήματος Επιστήμης και Τεχνολογίας Υλικών, Πανεπιστημίου Κρήτης

Επιβλέπουσα καθηγήτρια κ. Άννα Μητράκη

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Κτίριο Τμήματος Μαθηματικών και Εφαρμοσμένων
Μαθηματικών,**

Πανεπιστήμιο Κρήτης

Abstract:

For the past decades scientific research in the energy sector has been focused on utilization of sustainable energy sources, while developing new and more efficient energy production systems. Fuel cells are galvanic cells capable of electrochemical energy conversion, and are currently being studied and implemented as a promising solution. One major issue for large scale application of these devices is scalability, cost and complexity of fabrication. A proposed manufacturing solution is the deployment of printing techniques to fabricate thin film electrodes of fuel cells. In this study, the use of inkjet printing is considered as a deposition method for electrodes fabrication, however, due to the novelty of this technique, additional research is needed for the optimisation of ink development and film deposition of materials used in fuel cells. Currently, the main challenge of this interdisciplinary study on ink development is to produce suspensions of these complex metal oxides, that can be both stable over time and inkjet printable. Here, the study of fuel cell materials and formulated suspensions is presented. More specifically this presentation will include results on the development and optimisation of oxide nanoparticle suspensions, such as agglomeration of particles, suspension stability, storage tests, thermal degradation, temperature dependent rheological

characteristics, surface tension, and ink-to-substrate interactions. Such properties are of great importance when formulating particle suspensions to be used as inks in the fabrication of printed fuel cells.