ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

ΠΑΡΟΥΣΙΑΣΗ ΜΕΤΑΠΤΥΧΙΑΚΗΣ ΕΡΓΑΣΙΑΣ

Τίτλος

«Perovskite semiconducting nanomaterials for hydrogen evolution»

της Βασιλικής Φάκα, μεταπτυχιακής φοιτήτριας του

Τμήματος Επιστήμης και Τεχνολογίας Υλικών του Πανεπιστημίου Κρήτης

Επιβλέπων: Γεράσιμος Αρματάς

Παρασκευή 12/03/2021

15:00

Η παρουσίαση θα πραγματοποιηθεί μέσω τηλεδιάσκεψης σύμφωνα με το άρθρο τρίτο, παρ. 1 της με αριθμ. 115744/Ζ1/4.9.2020 Κοινής Υπουργικής Απόφασης (Β΄3707), στον παρακάτω σύνδεσμο:

https://virtconf.materials.uoc.gr/b/sta-gh4-3xn-y77

ABSTRACT

The aim of this master thesis is the synthesis and characterization of a novel photocatalyst combined by metal titanate rods and carbon nitride nanosheets, in order to be used for photocatalytic water splitting under visible light for H_2 production. The metal titanate rods are ilmenite type materials ($MTiO_3$) with M: Co, Ni, Zn, Mg, which traditionally are not active photocatalysts for the H2 production. The enormous advantages of these materials though, such as their physicochemical properties, their low cost and simple synthesis, their non-toxicity and their ability to be synthesized in a high-scale production, render them interesting to study as materials and attempt to develop them. Moreover, their tunable bandgap, their photo stability and their corrosion resistance in aqueous solutions make them potential candidates for photocatalytic water splitting reactions. Therefore, the combination of them, with other, promising materials, in order to make them active photocatalysts under visible light is a method to exploit them. The emphasis of this master thesis is given to the synthetic procedure of the novel material and to the morphological,

structural and optical properties. Therefore, all the synthesized powders were analyzed by X-Ray Diffractometry (XRD), Scanning Electron Microscopy (SEM), Energy Dispersive X-Ray Spectroscopy (EDS) and UV-Vis spectroscopy. Finally, the heterostructures were tested in photocatalytic water splitting for solar H_2 production, with the combination of metal titanates with carbon nitride nanosheets to have increased the activity of the individual materials.