

## 3<sup>rd</sup> International Webinar on ADVANCED MATERIALS

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### **The effect of the growth condition on the structure and the physical properties of Gd-doped Ti Co ferrite thin films via Pulsed Laser Deposition (PLD)**

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Pulsed Laser Deposition (PLD) allows the growth of thin films with complex chemical compounds and the structural properties can be controlled by the laser parameters. Gd doped Co-Ti ferrite ( $\text{Co}_{1.1}\text{Ti}_{0.1}\text{Gd}_{0.04}\text{Fe}_{1.76}\text{O}_4$ ) thin films have been deposited on cleaned Si(100) substrates at room temperature by the PLD with a Nd:YAG laser (1064 nm) and 10 Hz repetition rate. Deposition of the thin films was prepared in a high vacuum of pressure  $\sim 2 \times 10^{-6}$  Torr. Ex-situ thermal annealing of the thin films for 2 hours was performed at different temperatures. The thin-film structural properties, elemental analysis, and surface morphology were investigated by X-ray diffraction, Energy-dispersive X-ray spectroscopy, Raman spectroscopy, and scanning electron microscope. The film stoichiometry was found to match the target. The structural analysis results of the annealed Gd doped Co-Ti ferrite thin films indicated a preferential growth orientation and a single spinel structure. The surface morphology was improved after the annealing of the thin films.

#### **Biography**

Mohamed A. Hafez, teaching assistant in the faculty of computers and information, Cairo University from 2007 until 2016. During this period, he experienced working in the private sector as well especially with applying data mining techniques in the oil & gas industry. He did B.Sc. (2006) & M.Sc. (2014) from the faculty of computers and information, Cairo University in Egypt. M.Sc. thesis was in the area of Databases, resolving data conflicts/duplicates using Statistical methods. He is currently a PhD graduate student in the computer science department at Rice University. He is working in applying machine learning as surrogate models in weather forecasting.

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