Theoretical and Experimental Study of Iron Oxide Thin Film

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Abstract : The aim of this work was to development and characterisation of iron oxide thin films by spray pyrolysis technique. Influences of deposition parameters pile temperature on structural and optical properties have been studied Thin films are analysed by various techniques of materials. The structural characterization of films by analysis of spectra of X-ray diffraction showed that the films prepared at T=350,400,450 are crystalline and amorphous at T=300C. For particular condition, two phases hematiteFe2O3 and magnetite Fe3O4 have been observed. The UV-Visible spectrophotometer of this films confirms that it is possible to obtain films with a transmittance of about 15-30% in the visible range. In addition, this analysis allowed us to determine the optical gap and disorder of films. We conclude that the increase in temperature is accompanied by a reduction in the optical gap with increasing in disorder. An ab initio calculation for this phase shows that the results are in good agreement with the experimental results.

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