7th African Conference on Non Destructive Testing (ACNDT) & the 5th International Conference on NDT and Materials Industry and Alloys (IC-WNDT-MI)

2016

Evolution of texture and residual stresses with the thickness for aluminum nitride deposited by dcMS on Si (100)

B. Riah, A. Ayad, J. Camus, M.A. Djouadi, N. Rouag, F. Boukari

Abstract : This work presents a study of XRD measurements on the development of the fiber (0001) and residual stress with the film thickness. Aluminum nitride (AlN) films were deposited by dc magnetron sputtering (dcMS) on Si (100) substrates in Ar-Ngaz mixture, at different thickness. The texture characterizations of the films were performed by X-ray pole figure technique. It was found that with increasing of the thickness the fiber (0001) becomes more marked. The (10-11) and (10-12) FDPs confirm the presence of reinforcements on the (0001) fiber. The angles between these reinforcements are about 60° and 120°. The observed asymmetry increases with thickness and could be connected to the angular differences between the AlN (0001) and Si (100) which lead to a full distortion. The residual stress decreases with the thickness increase.

Keywords : AlN thin films, DC-PVD, Fiber texture, Asymmetry