

# Aluminium-induced crystallization of amorphous silicon films deposited by DC magnetron sputtering on glasses

F. Kezzoula, A. Hammouda, M. Kechouane, P. Simon, S.E.H. Abaidia, A. Keffous, R. Cherfi, H. Menari, A. Manseri

**Abstract:** Amorphous silicon (a-Si) and hydrogenated amorphous silicon (a-Si:H) films were deposited by DC magnetron sputtering technique with argon and hydrogen plasma mixture on Al deposited by thermal evaporation on glass substrates. The a-Si/Al and a-Si:H/Al thin films were annealed at different temperatures ranging from 250 to 550 °C during 4 h in vacuum-sealed bulb. The effects of annealing temperature on optical, structural and morphological properties of as-grown as well as the vacuum-annealed a-Si/Al and a-Si:H/Al thin films are presented in this contribution. The averaged transmittance of a-Si:H/Al film increases upon increasing the annealing temperature. XRD measurements clearly evidence that crystallization is initiated at 450°C. The number and intensity of diffraction peaks appearing in the diffraction patterns are more important in a-Si:H/Al than that in a-Si/Al layers. Results show that a-Si:H films deposited on Al/glass crystallize above 450 °C and present better crystallization than the a-Si layers. The presence of hydrogen induces an improvement of structural properties of poly-Si prepared by aluminium-induced crystallization (AIC).

**Keywords :** Crystallization, Thin films, Hydrogenated amorphous silicon, AIC, Raman, XRD