

Excimer Laser Wet Oxidisation of Amorphous Hydrogenated Silicon.

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Abstract

We present here results of excimer laser wet oxidisation of submicron thick amorphous hydrogenated silicon films (a-Si:H) deposited on silicon wafer. The a-Si:H film irradiation has been done by multiple-pulse, large-spot, 20 nano-second KrF (248 nm) excimer laser with a slope beam profile at a laser fluencies (140-300 mJ/cm²) near to silicon ablation threshold. The oxygen and hydrogen content and bonding in thin films were analysed by Fourier Transform Infrared Spectroscopy (FTIR) techniques in the range of 400-4000 cm⁻¹ wavenumbers. We demonstrate that presence of water molecules on the silicon surface will increase oxidization by 30-40%. The bonded hydrogen content in the films after oxidization annealing is decreased from 12at.% down to around one atomic percent.