

Spectral Ellipsometry and Electron Backscatter Diffraction Analyses of Silicon Surfaces Implanted with Silver Ions

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Abstract

© 2016, Springer Science+Business Media New York. Amorphous silicon (a-Si) produced on surfaces of single-crystal substrates (c-Si) by low-energy low-dose implantation of silver ions is studied by spectral ellipsometry and electron backscatter diffraction. Implantation was done with an ion energy of 30 keV at a constant ion beam current density of 2 $\mu\text{A}/\text{cm}^2$ and doses of $6.24 \cdot 10^{12}$ – $1.25 \cdot 10^{16}$ ions/ cm^2 on room temperature substrate targets. Irradiation was carried out with a current density of 0.1–5 $\mu\text{A}/\text{cm}^2$ for implantation doses of $6.24 \cdot 10^{13}$ and $1.87 \cdot 10^{14}$ ions/ cm^2 . It was found that spectral ellipsometry is an accurate and reliable method for monitoring low-dose ion implantation processes.

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Keywords

electron backscatter diffraction, ion implantation, porous silicon, spectral ellipsometry