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Germanium Thin Film Nano- and Micro-texturing Using Femtosecond Laser

Thursday, 17 November 2016 16:00 (30 minutes)

Vacuum coating electron gun depositor was used to grow thin film of germanium on a Corning glass substrate. The deposition rate of the film was set to 10 Å/s with the chamber pressure settled at 2 × 10-7 mbar. The thickness of the grown film was measured to be 400 ± 2 nm, this was done using piezo-crystal thickness monitor in the deposition chamber. The film was then treated with a femtosecond laser with a fundamental wavelength of 1030 nm, the laser beam was defocused above the sample, such that the energetic laser photons were only sufficient to heat the surface of the film and were out of ablation regime. High-resolution scanning electron microscope micrographs show an evaluation of the surface morphology of the film as the laser fluence increases. X-ray diffraction study of the film revealed a formation of an oxide phase of germanium as evident from the emergence of the diffraction peaks due to oxidation.

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