Title: THE EFFECT OF MORPHOLOGY AND REFLECTANCE IN SILICON NANOWIRES GROWN BY ELECTROLESS ETCHING

The strong light trapping properties of Silicon Nanowires have attracted much interest in the past few years for the conversion of sun energy into conventional electricity. Studies have been completed for many researchers to reduce the cost of fabrication and reflectance of solar light in these nanostructures to make a cheaper and more efficient solar cell technology by using less equipment for fabrication and employing different materials and solution concentrations. Silver, a conducting and stable metal is used these days as a precursor to react with silicon and then form the nanowires. Its adequate selection of solution concentration for a size of silicon substrate and the treatment for post-cleaning of silver dendrites make it a viable method among the others. It is an aim of this research to obtain significant low reflectance across the visible solar light range. Detailed concentration, fabrication and reflectance studies is carried out on silicon wafer in order to expand knowledge and understanding.

In this study, electroless etching technique has been used as the growth mechanism of SiNWs at room temperature. Optimum ratios of solution concentration and duration for different sizes of exposed area to grow tall silicon nanowires derived from experimentation are presented. Surface imaging of the structures and dimension of length and diameter have been determined by Scanner Electron Microscopy (SEM) and the reflectance in the optical range in silicon nanowires has been make using UV-Visible Spectrophotometer.

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Approved for distribution by Kalpathy Sundaram, Committee Chair, on June 12, 2017.

The public is welcome to attend.