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Morphological, Structural and Optical Properties of Porous Silicon Nanowires (PSiNWr) Film Elaborated on N-Si Substrate

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In The last years, nanostructures of materials, as the porous silicon nanowires (PSiNWs), have been used extensively studied for the development of several chemical, electro-chemical and biologic sensors, because of their physical and chemical characteristics. The PSiNWs present a unique property, like the biocompatibility and the multifunctional. The PSiNWs can be elaborated from lightly n-type (100) silicon substrate by Ag assisted chemical etching method. After porous silicon nanowires growth a multitude of charatcterisation by different techniques has been carried out as, scanning electron microscopy (SEM), spectrophotometry (reflexion-transmission), photoluminescence (PL), infrared spectroscopy and secondary ion mass spectrometry (SIMS).

As interesting results, a reflectance value lower than 2% and a strong photoluminescence signal, with a pic centered at the 600 nm have been found from the elaborated samples. Finally, the obtained results can find application in low-cost and high efficiency porous silicon nanowires based solar cells.