The increase in the demand of energy over the world has challenged to find alternative sources of energy. Nanostructured semiconductor devices are expected to play an essential role in the development of the next generation of solar cell technology. Among the more promising materials that have been studied, Si and Ge hold great interest, nevertheless the Ge is a better candidate due its favorable band gap and better transport properties.

In order to synthesize Ge nanoparticles, high purity silica glass plates were implanted with 2 MeV Ge ions, using fluences of 8E16 to 1.6E17 ions/cm2. After implantation the samples were thermally annealed in a reducing atmosphere (50%N2+50%H2) at 600, 700, 800, 900 and 1000ºC. The thermal treatment is used to promote the nucleation of the Ge nanoparticles the supersaturated solution, as well as to passivate the defects formed during implantation. The Ge samples were characterized by means of Rutherford Backscattering Spectrometry (RBS) and Photoluminescence (PL) spectroscopy. In this work we study the relationship between the implantation fluence and the annealing temperature with the photoluminescence response of the Ge devices.

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**Keywords:** germanium nanostructures, photoluminescence, implantation

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