

Investigation of acceptor removal by 4-point probe and LTPL measurements

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To investigate the acceptor removal by irradiation, high resistivity FZ silicon samples are implanted by boron, gallium and indium. A co-implantation with oxygen, carbon, nitrogen and fluor is done as well. After Implantation the samples are annealed in an RTP furnace. The sheet resistance and low temperature photoluminescence (LTPL) spectra are measured. Then the samples are irradiated by 1MeV electrons and 23MeV protons. Subsequently, the sheet resistance and the LTPL spectra are measured again.

In the pre-irradiated state the implanted boron atoms are only affected by the high dose carbon co-implantation. This co-implantation increases the sheet resistance of the sample. In case of the indium doping the co-implantation affects the sheet resistance strongly. After irradiation a strong scattering in the 4-point probe measurement occurs making the interpretation of the results difficult. Nevertheless it has been found by LTPL measurements that the acceptors are to the most part removed by the irradiation.

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