

Oxidation-induced stacking faults in nitrogen doped Czochralski silicon

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The behavior of Oxidation-induced stacking faults (OSFs) in nitrogen-doped Czochralski (NCZ) silicon has been investigated in comparison with nitrogen un-doped Czochralski (CZ) silicon. Samples were treated by one or two-step thermal treatments and then wet oxidation. The size and density of OSFs in the samples were checked by optical microscopy and Transmission Electron microscopy (TEM). It was found that OSFs generated in the NCZ silicon, but not in the CZ silicon, while the samples were treated by preannealing at the low temperatures (750 °C) for a short time. With the increase of preannealing time at the low temperature, the OSF density kept almost unchanged in the NCZ silicon, but increased greatly in the CZ silicon. Meanwhile the OSF size in the NCZ silicon was larger than that in the CZ silicon. The role of nitrogen on the density and size of OSFs were also discussed.