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"Dependence of Thermal Annealing Conditions on Photoluminescence in SiO_2 films"

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Visible photoluminescence(PL) in Si^+-implanted SiO_2 films on crystaline silicon were observed. Thermal oxide films of 1 μm thickness on P-type crystal silicon were made and Si^+ ions were implanted with 200 keV acceleration voltage on it. Argon laser(wavelength 488nm) and PM tube were used for PL measurements. As annealing time increased at low temperature, the visible PL intensity are increased and the peak positions are changed. On the other hand, with increasing annealing time at high temperature, the visible PL intensity are disappeared. From the PL peaks and intensity changes, XRD results, and TEM observations, we will discuss the origin of PL in Si^+-implanted SiO_2 films with oxygen rich defects and silicon rich defects.