DEFECT STRUCTURE OF DISLOCATIONS-FREE SILICON AFTER IMPLANTATION OF HYDROGEN AND ANNEALING UNDER CONDITIONS OF HYDROSTATIC PRESSURE

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S u m m a r y

Formation of specific defects at depths exceeding the depth of the burried layers of samples implanted by hydrogen is established by means of the Bragg X-ray diffraction investigation of a defect structure for dislocations-free crystals of silicon after the implantation of hydrogen ions and annealing at the temperature of 650° under conditions of hydrostatic pressure. The diffuse scattering of X-ray beams is detected, which probably happens on hydrogen bubble-like defects. They appear due to fast diffusion of hydrogen atoms. Some improving of a structural perfection of crystals is detected by an enhancement of hydrostatic pressure during annealing. A growth in the time of annealing and value of hydrostatic pressure results in a diminution of the integral reflectivity, R_i, and the relative share of a distorted lattice, ρ_0. The hydrostatic pressure stimulates the process of formation of hydrogen pores at considerable depths, which are responsible for the formation of diffraction peaks.