PECULIARITIES OF THE DEFECT FORMATION IN THE NEAR-SURFACE LAYERS OF Si SINGLE CRYSTALS UNDER ACOUSTOSTIMULATED IMPLANTATION OF IONS OF BORON AND ARSENIC

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S u m m a r y

We study the peculiarities of the transformation of point defects and elastic deformations in the near-surface layers of silicon implantated by B^+ and As^+ ions under the simultaneous *in situ* action of ultrasound (US). As a method of study of a structural perfection of implanted structures, we used multi-crystal X-ray diffractometry. By secondary-ion mass-spectrometry, we determined the thickness distributions of the implanted impurities after the thermal annealing and studied the influence of the US treatment on them. It is shown that the implantation of B^+ into Si samples increases the mechanical stress in the near-surface regions of a wafer. The additional action of US on the implantation causes not only some decrease in stress, but also changes the deformation sign, which is due to both the redistribution of point defects and the variation of their sizes. The annealing of samples at $T = 800 \div 950$ °C induces the stress relaxation in the initial samples and in the implanted ones irrespective of the ions type, and the action of US stimulates this process of relaxation yet more. A physical model of the discovered effects is proposed.