

Figure 1. Bright-field cross-section TEM images (a-c) and RBS/Ch spectra (d) obtained from the Si/SiSn/Si multilayer system after MBE growth: (a) and spectra 1A and 1R; thermal treatment at 900 C for 20 min.: (b) and spectrum 2A; and after subsequent He⁺ irradiation: (c) and spectrum 3R. Inserted in (a), (b) and (c) are 5 times magnified Sn precipitate image fragments. Images in (b) are under-focussed.

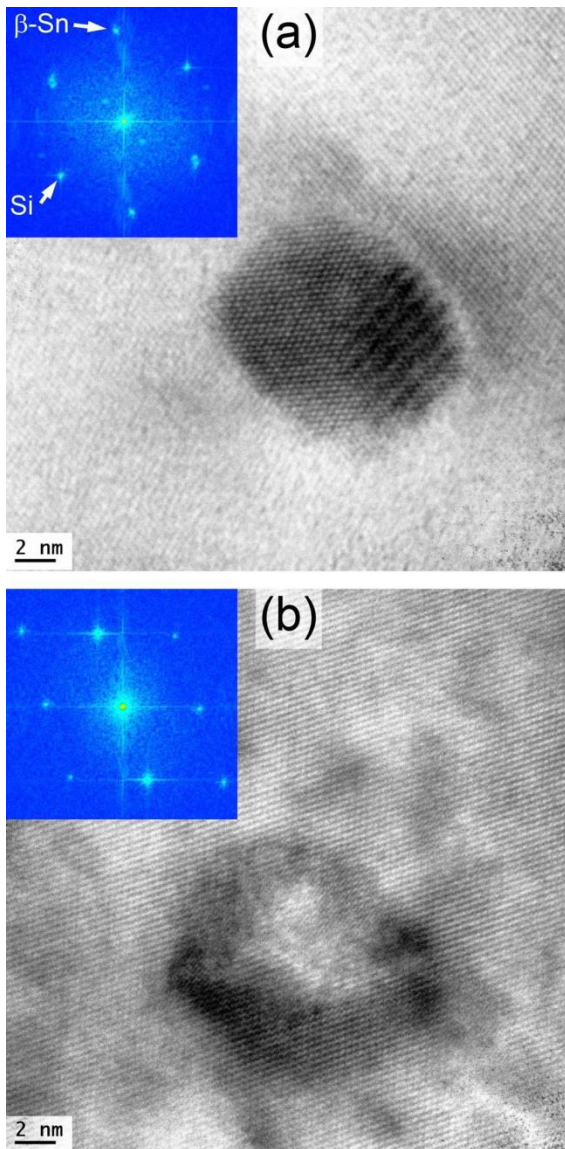


Figure 2. High resolution TEM images of Sn precipitates obtained in the Si/SiSn/Si multilayer system after MBE growth followed by thermal treatment at 900 °C for 20 min: (a), and after subsequent 30 keV, $6 \times 10^{15} \text{ cm}^{-2}$ He⁺ irradiation: (b). Inserted in left-top corners are the corresponding Fourier transforms.

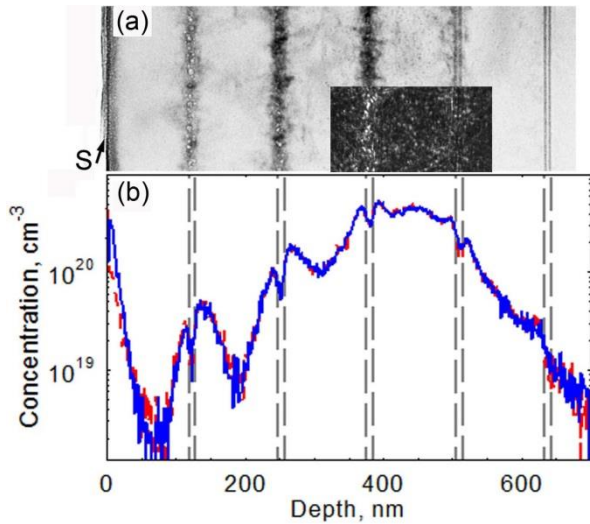


Figure 3. Carbon depth profiles after high temperature implantation in strained Si/SiGe/Si multilayered system and induced structural defects.

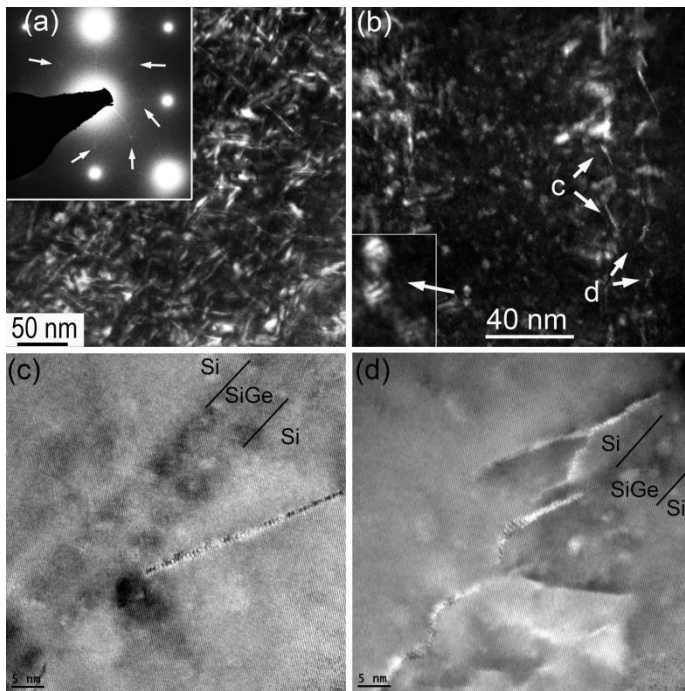


Figure 4. Plan-view (a) and cross-section (b,c,d) TEM images of structural defects obtained from the multi-layered Si/SiGe structure after high temperature carbon implantation (525 °C) (150 keV, 1×10^{16} C/cm²). A diffraction pattern (inset in the left-top corner of image (a) is obtained from the sample, prepared in plan-view geometry. The dark-field image (b) is obtained from the area of the mean range (around 300-600 nm) in the (200) diffraction spot of carbon. The dark field image (a) is obtained in overlapping (111) reflections of Si and carbon (presumably). The plate-like defects, indicated by arrows in (b), are pictured in (c) and (d) as bright-field TEM images of high resolution.

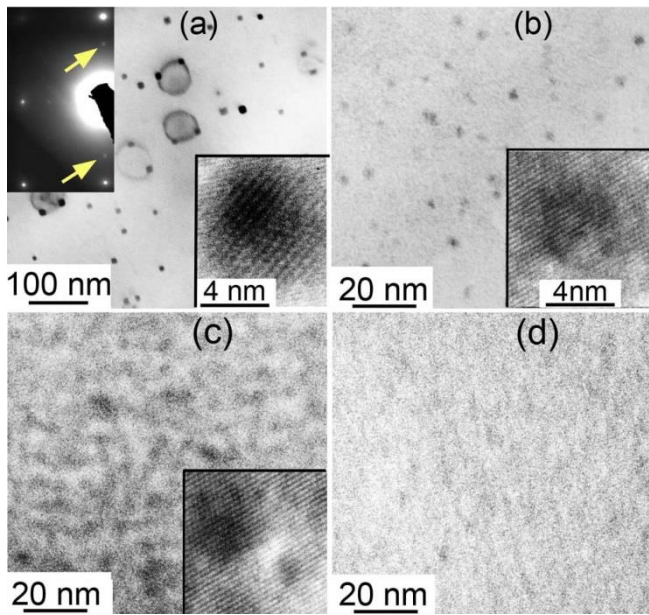


Figure 5. Plan-view TEM images and SAED pattern (top-left inset in (a)) of the layered Si/SiSn/Si structure after MBE growth, implantation of 100 keV carbon ions (b-d) and thermal treatment at 900 °C for 30 min. Implantation conditions were: (a) - no carbon implantation; (b) - 2×10^{14} C/cm² at 525 °C; (c) - 2×10^{15} C/cm² at 525 °C; (d) 2×10^{15} C/cm² at room temperature. Inserts in (a-c) are high resolution images of precipitates.

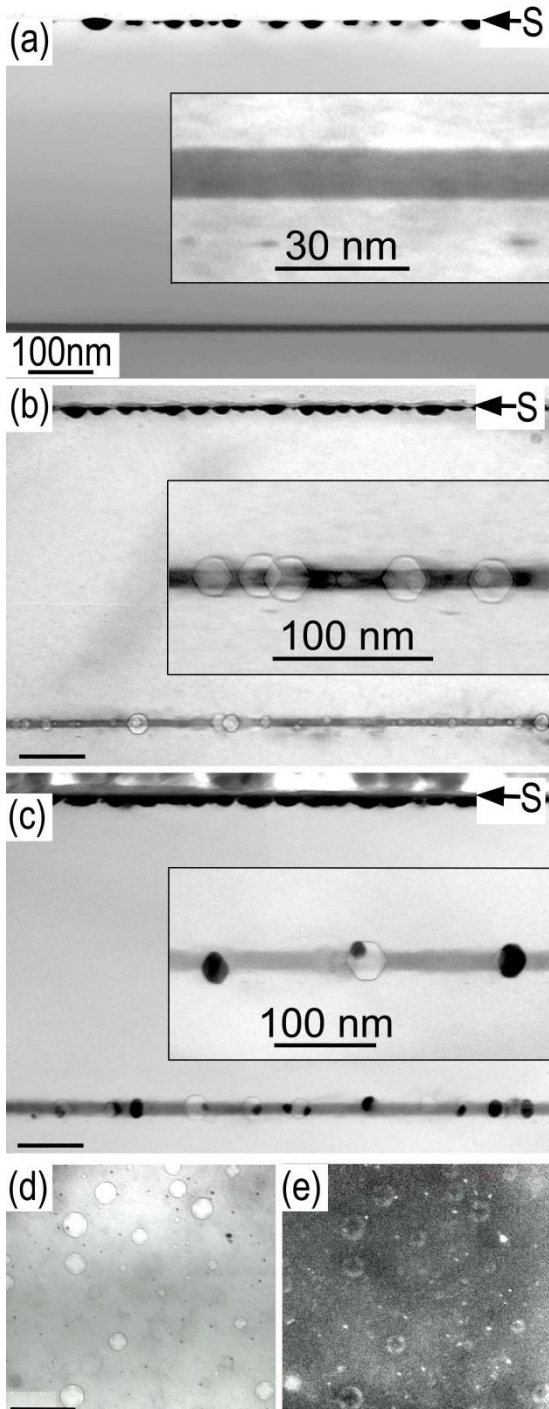


Figure 6. TEM images of MBE grown Si/SiGe/Si structure after deposition of 2.5 nm Au, He⁺ implantation (60 keV, $6 \times 10^{15} \text{ cm}^{-2}$, 250 °C) and annealing at 700 °C – b,d,e, or 850 °C – a,c. Sample (a) was not implanted before annealing. Inserted in a-c are magnified image fragments. Scale lines in b – d are 100 nm

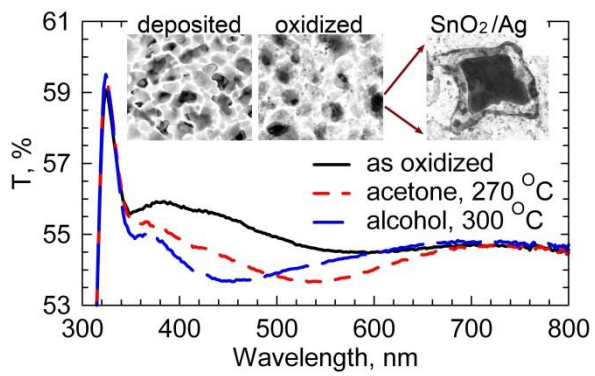


Figure 7. Transmission spectra of $\text{Sn}_{0.35}\text{Ag}_{0.65}$ alloy layers on a fused silica after magnetron deposition followed by thermal treatment at different conditions