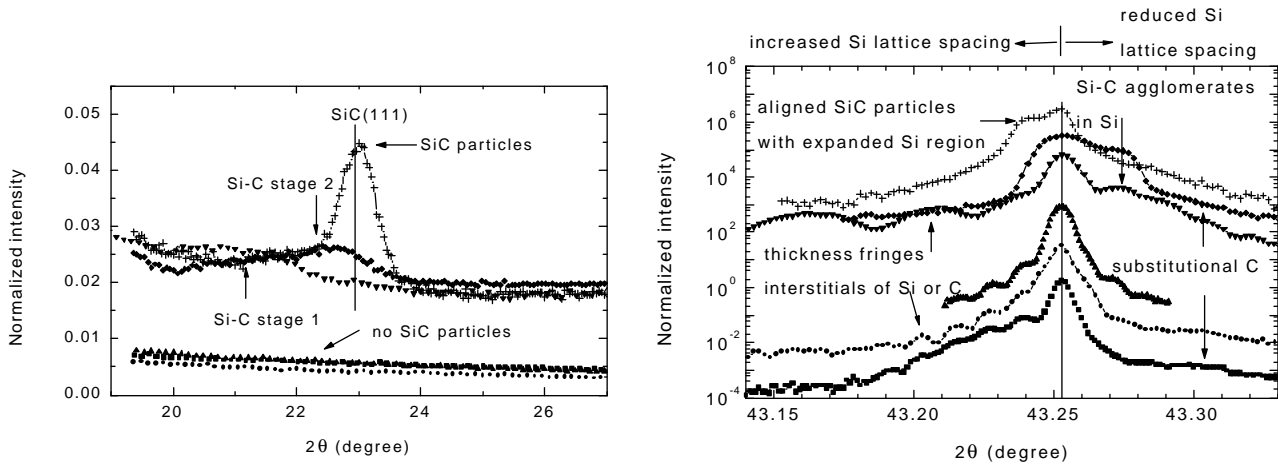


diffraction the strain in the crystalline material (Si substrate and SiC particles) due to implantation and the first stages of forming the SiC phase in the Si lattice (details in [4]).

Implantation of C ions with an energy of 195 keV into Si wafers heated up to 800 °C results in an elastic distortion of the Si host lattice and in the formation of crystalline SiC particles or their prestages depending on implantation dose and temperature. Only a Si lattice deformation without growth of SiC was observed if the fluence does not exceed 5×10^{15} C ions/cm². After implantation of C ions up to 4×10^{17} cm⁻² at a temperature of 500 °C, agglomerations of Si-C and an altered state of Si lattice deformation are found. By implantation of 4×10^{17} ions/cm² at 800 °C, particles of the 3C-SiC (β -SiC) phase grow, which are aligned to the Si matrix [4].



Figures: On the left - Diffraction curves (θ : 2θ scans) in the vicinity of the most intense 3C-SiC(111) reflection indicating the formation of Si-C prestages and crystalline SiC particles. Curves correspond to different implantation conditions (fluence in ions/cm² and temperature): ■ 5×10^{15} at room temperature, ● 5×10^{15} at 500 °C, ▲ 5×10^{15} at 800 °C, ▼ 5×10^{16} at 500 °C, ◆ 4×10^{17} at 500 °C, + 4×10^{17} at 800 °C.

On the right - Diffraction curves of the Si(400) reflection revealing the lattice strain component perpendicular to the sample surface. Characteristic features and their reason are marked.

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