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B couples formation and dissolution in ion implanted Si. EMANUELE RIMINI, LUCIA ROMANO, ALBERTO PIRO, MARIA GRAZIA GRIMALDI, Dipartimento di Fisica, Universitá di Catania — The off-lattice displacement of electrically active, substitutional B in presence of Si interstitials generated by light ion irradiation has been studied by channeling along the <100> and <110> axes. The channeling yield χ of B increases with the ion fluence until it saturates at $\chi \approx 0.5$ suggesting a non-random B displacement. At the saturation B is not electrically active and accurate angular scans indicates the formation of B-B couples aligned along the <100> direction in agreement with first principle calculations. The same kind of defect is formed upon B implantation at room temperature as demonstrated also by angular scans with $\chi_B \approx 0.5$. A peculiar behavior is observed upon annealing: at 800 $^\circ$C a significant increase of randomly located B occurs and $\chi_B \approx 1$, at higher temperatures B recovers progressively into substitional site. The χ_B reaches 0.1 at 950 $^\circ$C and the carrier concentration coincides with the amount of substitutional B. The increase of χ_B at 800 $^\circ$C can be due to the dissolution of B couples and to an intermediate off lattice location of B before to occupy a substitutional site.

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