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The influence of chromium and iron atoms on the processes of defect formation in silicon

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Consideration is given to the effect of chromium and iron atoms on the processes of defect formation in silicon. It was found that with the simultaneous introduction of chromium and iron into silicon simultaneously with a decrease in the concentration of the levels $E_c - 0.41$ eV and $E_c - 0.51$ eV (Cr) and $E_v + 0.41$ eV (Fe), a new level is formed in the upper half of the band gap with the ionization energy $E_c - 0.30$ eV, which is probably associated with an impurity pair of Cr with Fe in Si. It was found that the decrease in N_C^{opt} and N_O^{opt} depends on the concentration of electrically active atoms of chromium and iron. It is 10–25 % for oxygen, and the value of N_C^{opt} almost does not change.

Keywords: interimpurity interaction, deep levels, resistivity, type of conductivity, infrared absorption, defect formation, high-resistance silicon.

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