

CORRELATION EFFECTS IN X-RAY EMISSION
SPECTRA OF $KL_{2,3}^2$ - AND $KL_{2,3}^3$ -IONIZED
SILICON ATOMS

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S u m m a r y

The relative intensities $\eta = I(\alpha_{5-8})/I(\alpha_{3,4})$ and $\chi = I(\alpha_{9-12})/I(\alpha_{3,4})$ of X-ray emission $K\alpha_{3,4}$ -, $K\alpha_{5-8}$ - and $K\alpha_{9-12}$ -lines groups of silicon atoms are experimentally studied under the excitation by electron impact in the range of accelerating voltage $U = (8 \div 100)$ kV. It is found that the probabilities of creation of the $K_{2,3}^2$ -configuration (P_2) and $LK_{2,3}^3$ -configuration (P_3) states monotonically decrease, when $E \geq 15$ keV (greatest effect $\approx 30\%$ at $E = 100$ keV). The observed decrease of P_2 and P_3 values can be explained by decreasing the average energy transferred to the atom in electron-atomic collision. However, the ratios $R_{21} = P_2/P_1$ and $R_{32} = P_3/P_2$ are constant in the whole range of accelerating voltage. The experimental values P_2 and P_3 are compared to the theoretical predictions based on the simultaneous independent shake-off approximation ($P.2$ and $P.3$). It is shown that $P_2/P.2 = 1.9 \div 2.7$ and $P_3/P.3 = 3.8 \div 5.2$. Such a disagreement between experimental values and theoretical predictions testifies to a significant role of multielectron correlation in the processes of $KL_{2,3}^2$ - and $KL_{2,3}^3$ -ionization.