

INTEGRAL CROSS SECTIONS OF IONIZATION
OF L -SUBSHELLS OF TUNGSTEN ATOMS
UNDER ELECTRON BOMBARDMENT
NEAR ENERGETIC THRESHOLD

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S u m m a r y

The relative intensities $h = I(\beta_1)/I(\beta_3)$ and $g = I(\beta_{2,15})/I(\beta_3)$ of $L\beta_1$, $L\beta_{2,15}$, and $L\beta_3$ lines of the X-ray emission $L\beta$ spectrum of tungsten atoms W are experimentally studied under electron bombardment in a range of accelerating voltages $U = 13 \div 35$ kV. On the basis of the derived experimental data, the ratios of the integral cross sections σ_2/σ_1 and σ_3/σ_1 of ionization of L_1 , L_2 , and L_3 subshells are determined. For the account of the electron beam energy reduction under deepening in the substance of a specimen, the effective energy of electrons was used. It is revealed that the distinctions between the results of calculation in the classical model of binary collisions (MBC), those by the semiempiric Bethe formula with parameters derived for the K -shell ionization (BK), and the experimental values of σ_2/σ_1 and σ_3/σ_1 do not fall outside the limits of experimental errors ($8 \div 10$ % for σ_2/σ_1 and $13 \div 15$ % for σ_3/σ_1) in the region $U \geq 17$ kV. In the near-threshold region $U < 16$ kV, a good agreement between experimental data and theoretical results based on the MBC is preserved, whereas the differences between BK-calculations and experiment grow essentially, by reaching 30% for σ_2/σ_1 and 45% for σ_3/σ_1 at $U = 13$ kV. The parameters in the semiempiric Bethe formula are determined and can be used in calculations of the integral cross sections of ionization of L_1 , L_2 , and L_3 subshells.