

Excitation of silver atoms from the ground S state to the first excited P state by electron impact

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Silver is extensively employed in various scientific, technological and practical applications [1-3]. In our previous papers we reported results (differential DCSs and integrated ICSs cross sections) of combined experimental and theoretical study of excitation of the silver atom from the ground $4d^{10}5s^2S$ state to the first combined resonant $4d^{10}5p^2P_{1/2,3/2}$ state (fine-structure doublet with total angular momenta of $J = 1/2$ and $3/2$ and energies of 3.664 and 3.778 eV, respectively) [4, 5]. Recently, we published results for electron impact excitation of the $4d^95s^2D_{3/2}$ (4.304 eV) and $4d^{10}6s^2S_{1/2}$ (5.276 eV) states [6]. Since McNamara *et al.* in their relativistic convergent close coupling (RCCC) computation [7] raised queries about the validity of our DCSs for resonant excitation, we have reanalyzed the earlier experimental DCS data. We have found that DCSs at 20 and 40 eV need to be renormalized due to incorrectly splicing our very forward-angular distributions onto our middle and backward-angular distributions. The new appropriate renormalization factor were applied and here we present new experimental DCSs results and the comparison with calculated relativistic distorted wave (RDW) and nonrelativistic atomic optical potential model data.

References

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