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Theoretical study of helium atom single ionization by bare carbon ions impact

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Abstract

In this work, the single ionization of helium atoms from the ground and the first excited state by bare carbon ions (C^{6+}) impact at the incident energy of 100 MeV has been studied. The post form of CDW-4B formalism is used in the calculations. The correlated Silverman wave function as the ground state of the helium atom has been used to consider the effects of static electron correlation. The results, as the fully differential cross section in the azimuthal plane for different angles and the ejected electron energy 6.5 eV and momentum transfer 0.75 a.u., are compared with experimental and three-body formalism results from theory. Also, the variations of the fully differential cross section in the scattering plane for the various ejected electron energies and momentum transfers have been studied.

Keywords: single ionization, fully differential cross section, CDW-4B.

For full article, refer to the Persian section