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Inelastic processes in collisions of Na^+ , K^+ , Rb^+ ions with He and Ar atoms R. YA. KEZERASHVILI, New York City College of Technology, City University of New York, USA, R.A. LOMSADZE, M.R. GOCHITASHVILI, N.O. MOSULISHVILI, Tbilisi State University, Georgia — Absolute cross sections for charge-exchange, ionization, stripping and excitation for Na^+ - Ar, K^+ - He and Rb^+ - Ar collisions were measured in the energy range 0.7- 7.0 keV. The experimental techniques include a condenser-plate method, angle-and-energy – dependent collision of product ions, energy loss and optical spectroscopy were used for an accurate determination of the structure of inelastic cross sections for these collisions. The experimental data are used to draw certain conclusions related to mechanisms of the corresponding processes. A correlation diagram of the adiabatic quasimolecular terms of these systems has been employed to discuss the mechanisms for these processes. It is shown that charge exchange in K^+ - He as well as in Rb^+ - Ar collisions mostly occur through the channel resulting from the capture of the electron to the ground state of the atoms in regions of pseudo-crossing of the potential curves of $^1\Sigma$ symmetry. The primary ionization mechanism for all colliding pairs is investigated. Stripping in K^+ - He collisions (stripping in case of Na^+ , Rb^+ - Ar were not observed) occurs via a mechanism involving a transition of adiabatic term into the continuum in the region of nonadiabatic interaction of molecular orbits with orbital angular moments which are identical in the limit of the united atom. The excitation mechanisms of collision partners are established.

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