Ionization and charge exchange cross sections in collisions of singly charged lithium and sodium ions with helium and nitrogen atoms

Károly Tőkési[1]

[1] *Institute for Nuclear Research (ATOMKI), Hungary*

We present total and energy and angular differential cross sections for single-ionization and single charge exchange in a collision between singly charged lithium and sodium with ground-state helium and nitrogen atoms. For sake of simplicity, the considered collision systems are treated as three-body problems. The helium and nitrogen atomic targets are described within the single active electron approximation using a Garvey-type distance-dependent model potential where only the ground-state outermost electron is involved in the collision dynamics as an active electron while the other bound electrons are considered inactive [1,2]. The interactions between the projectile and target system are also described by the Garvey-type potential. The scattering problem is solved within the frame of the classical trajectory Monte Carlo (CTMC) [3].

We found that the classical treatment of the collision problem describes reasonable well both the total and differential cross sections. Our present CTMC results are in good agreement with available theoretical and experimental data.

References

1. R. H. Garvey, C. H. Jackman, A. E. S Green, Phys. Rev. A 12(4), 1144 (1975).

2. A. E. S. Green, Advances in Quantum Chemistry 7, 221 (1973).

3. K. Tőkési et al., Nucl. Instrum. Methods Phys. Res. B: Beam Interact. Mater. At. 86, 201 (1994).

Acknowledgements

Presenting Author Email Address: *tokesi@atomki.hu*