

Spectral properties of plasma embedded He-like Ar XVII under the influence of external magnetic field

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The atomic structure calculations and radiative properties of He like Ar XVII in the presence of dense plasma environment and external magnetic field have been presented. For this purpose, the relativistic configuration interaction method (RCI) by incorporating the generalized b-potential and external magnetic field has been implemented. In the case of free atoms or ions, our calculated results are in good agreement with NIST and other available data. Plasma screening effect on $1s^2\ ^1S_0 \rightarrow 1s2p\ ^3P_1$ and $1s2p\ ^1S_0 \rightarrow 1s2p\ ^1P_1$ transitions of Ar XVII ion in the presence of an external magnetic field has been investigated. The Zeeman splitted energies and the excitation energies of Ar XVII ion for the magnetic sublevels $1s2p\ ^3P_0$ ($M_j = 0$), 3P_1 ($M_j = 0, \pm 1$), 3P_2 ($M_j = 0, \pm 1, \pm 2$), 1P_1 ($M_j = 0, \pm 1$) has been calculated and the variation in the binding energy of Ar XVII in plasma environment and magnetic field has been observed. Our results will be useful in the modeling and diagnostics of laboratory and astrophysical plasmas.

References

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