

Collisional radiative model for the diagnostics of ICP Krypton plasma using relativistic fine-structure cross-sections

Dipti^a, R. Srivastava^a, R. K. Gangwar^b and L. Stafford^b

^aDepartment of Physics, Indian Institute of Technology Roorkee, Roorkee 247667, India

^bDépartement de Physique, Université de Montréal, Montréal (Québec) H3C 3J7, Canada

In the present work, the radially-averaged emission intensities in the 750-900 nm range were recorded for low pressure inductively coupled (ICP) krypton plasma in the range of pressure from 1-50 mTorr. A CR model [1] has been developed to study ICP Kr plasma. The various processes such as electron-impact excitation, ionization and their inverse processes through detailed balance principle have been considered. We have calculated fine-structure relativistic-distorted wave (RDW) electron impact excitation cross sections [2] and incorporated in the CR model. The required rate coefficients are obtained by assuming a Maxwellian distribution. Electron temperature is estimated by the best fit between the optical emission measurements for nine strong lines arising from Kr ($4p^55p \rightarrow 4p^55s$) transitions and model predications. Results of our calculations along with theoretical details will be presented.

References

[1] Dipti, R. K. Gangwar, R. Srivastava and A. D. Stauffer, *Eur. Phys. J. D* **67** 40244 (2013).

[2] R. K. Gangwar, L. Sharma, R. Srivastava, and A. D. Stauffer, *Phys. Rev. A* **82** 032710 (2010).

References

[1]

[2]