Collisional radiative model for Ar/O\(_2\) plasma with reliable fine structure resolved cross sections.\(^1\) PRITI PRITI, Indian Institute of Technology Roorkee, Roorkee, India, REETESH GANGWAR, Weizmann Institute of Science, Rehovot, Israel, RAJESH SRIVASTAVA, Indian Institute of Technology Roorkee, Roorkee, India — A collisional radiative (CR) model has been developed for Ar/O\(_2\) mixture plasma. Here we extend our previous CR model for pure Ar plasma [1] by including the quenching of the excited Ar atoms with O\(_2\) along with the other processes \(viz.\) radiative population transfer, electron impact excitation and ionization. Since electron collision processes play vital role, a complete data set obtained using relativistic distorted wave theory is used. Present work is in the light of recent measurement [2] on Ar/O\(_2\) (0-5\%) mixture plasma at 2 Torr pressure. Diagnostics have been done by optimizing the normalized intensities obtained from this model with the measured intensities [2] for different transitions between fine stricture levels. The population densities of fine structure states of Ar(1s) are obtained and compared with the measurements [2] at different O\(_2\) fractions. The electron temperature is found to increase (0.9 to 1.8eV) with O\(_2\) fraction (0-5\%).


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