

## The Influence of Radiation Trapping on the Metastable Population Density and Applications to Low-pressure Plasma

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Emission lines ratios were used for diagnostics of and excited level densities in low-temperature plasmas. In this work, an optical emission spectroscopy (OES) was used to determine the electron temperature and metastable level densities in low-pressure inductively coupled plasma. The emission spectroscopy method was based on a simple collisional-radiative model. The selected lines of the Ar(4p to 4s) were influenced by the radiation trapping at relatively high pressures where the plasma become optically thick. To quantify this effect, a pressure dependence factor  $\alpha$  (P) was derived by using corrections for the measured intensities. It was found that the lower metastable level densities were obtained when  $\alpha$  (P) increased with the increasing discharge pressure. The effect of non-Maxwellian electron energy distribution functions (EEDFs) on the metastables was also presented and discussed.

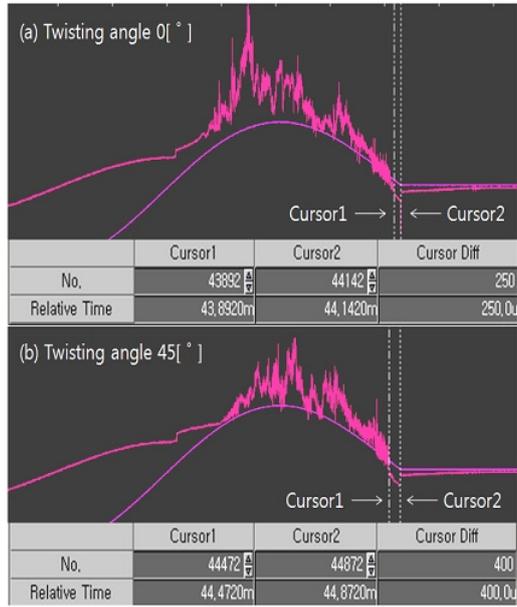


그림 1.

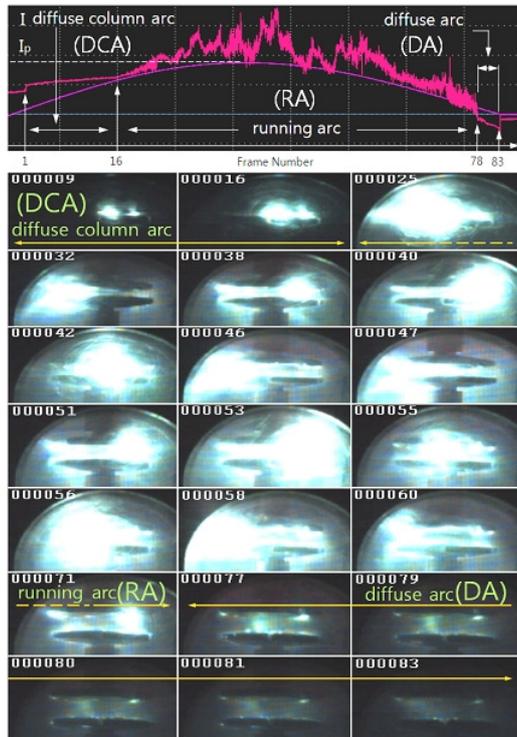


그림 2.

**Keywords:** metastable level density, optical emission spectroscopy, pressure effect