

Abstract Submitted
for the GEC09 Meeting of
The American Physical Society

The electron temperature measurement by using an optical emission spectroscopy in inductive Ar/O₂ mixture discharge YU SIN KIM, YOUNG-KWANG LEE, CHIN-WOOK CHUNG, Hanyang University — Electron temperatures (T_e) were measured by using an optical emission spectrometer (OES) method in Ar/O₂ mixture inductively coupled plasma. The OES method is based on the simple collisional-radiative model with relative intensities from the light emission of the argon 4p level [1]. The OES measurements were compared with the floating harmonics method [2]. At a pure argon discharge of 5 mTorr, the measured T_e from the OES method was 3.6 eV. As O₂ flow rates increase, the T_e increased gradually from 4.1 eV to 4.7 eV. However, the T_e from the OES method was slightly higher than that of the floating harmonics method. These differences caused by changed metastable densities which can affect the light intensity ratio of the 4p lines and the error of rate coefficient(K) values. Although there are a little difference of the T_e , note that trends of the measured T_e with the O₂ addition were good agreement with that from the floating harmonics method. These results show that our OES method is applicable to the plasma diagnostics in the mixture gas discharges such as an industrial plasma process monitoring because this noninvasive OES method does not perturb the plasmas. [1] Y.K. Lee, K.T. Hwang, M.H. Lee and C.W. Chung, J. Korean Phys. Soc. 52. 6(2008) [2] M.H. Lee, S.H Jang, and C.W. Chung, J. Appl. Phys. 101, 033305 (2007)

Yu Sin Kim
Hanyang University

Date submitted: 12 Jun 2009

Electronic form version 1.4