

Abstract Submitted
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Measurement of radial density of Ar metastables in an inductively coupled plasma in Ar/O₂ YUICHIRO HAYASHI, SATOSHI HIRAO, TOSHI-AKI MAKABE, Keio University — O₂ plasma is used for ashing and trimming of the resist in semiconductor production processes, and for the surface modification of metals and polymers. In these processes atomic O radicals play important roles. It is reported that the density of atomic metastables increase in Ar/O₂ mixture as compared with that in pure O₂ in CCP [1]. We measured the radial profile of the density of Ar metastables (1s3, 1s5) and the temperature in an inductively coupled plasma at 13.56 MHz in Ar/O₂ as a function of admixture O₂ by using laser absorption spectroscopy. The average densities of metastable Ar are $2 \times 10^{10} \text{ cm}^{-3}$ (1s3) and 10^{11} cm^{-3} (1s5) for 0-20% O₂ fraction, and have the peak at 5-10%. The temperatures are 2000 K (1s3) and 1600 K (1s5) and are heighest at 10%.

[1] T. Kitajima, T. Nakano, and T. Makabe, Appl. Phys. Lett., **88**, 091501 (2006).

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