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Electron Temperature and Plasma Density in Ar/N2 Admixtured Non-thermal Atmospheric Pressure Plasma Jet PRADOONG SUANPOOT, Maejo University, JIRAPONG SORNSAKDANUPHAP, BHAGIRATH GHIMIRE, BHAGIRATH GHIMIRE, YOUNG JUNE HONG, GUANG-SUP CHO, EUN-HA CHOI, Kwangwoon University — A model based on plasma propagation velocity has been recently developed to estimate the electron temperature (Te) of non-thermal plasma jets. In this work, we have extended this model to calculate Te for plasma generated with mixed gases (Ar/N2) and the results are compared with pure Ar. Plasma has been generated by input discharge voltage of 3.0 kV at driving frequency of 40 kHz. A high-speed single-frame intensified charged coupled device (ICCD) has been used to observe the space and time-resolved discharge images and estimate the value of plasma propagation velocity (ug). The value of ug for Ar/N2 admixtures (0-5%) has been obtained in the range of 104-105 m/s. The electron temperature have been calculated for these mixed gas plasmas. The average electron temperature has been found to be about 1.18 eV for Ar plasma and it increases up to 1.39 eV for plasma with Ar/N2 admixture. Also, the average plasma density has been found to be about 6.611014 cm-3 for Ar plasma and it decreases down to 2.741014 cm-3 for plasma with Ar/N2 admixture. Our results obtained with modified convective-wave packet model can be a new contribution to plasma medicine.

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