Electron Density and Electron Temperature in Atmospheric Pressure Microplasma

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In this work we measured electron temperature and electron density of a microplasma by optical emission spectroscopy. The plasma is generated from a small discharge gap of a microwave parallel stripline resonator (MPSR) in Helium at atmospheric pressure. The microwave power supplied for this plasma source from 0.5 to 5 watts at a frequency close to 800 MHz. The electron temperature and electron density were estimated through Collisional-radiative model combined with Corona-equilibrium model. The results show that the electron density and temperature of this plasma in the case small discharge gap width are higher than that in larger gap width. The diagnostic techniques and associated challenges will be presented and discussed.

Keywords: atmospheric pressure plasma, OES, microplasma, microwave plasma