SP-005 <Invited Talk>

Measurement of Plasma Parameters (Te and Ne) and Reactive Oxygen Species in Nonthermal Bioplasma Operating at Atmospheric Pressure

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We have generated the needle-typed nonthermal plasma jet by using an Ar gas flow at atmospheric pressure. Diagnostics of electron temperature anddensity is critical factors in optimization of the atmospheric plasma jet source in accordance with the gas flow rate. We have investigated the electron temperature and density of plasma jet by selecting the four metastable Ar emission lines based on the atmospheric collisional radiative model and radial profile characteristics of current density, respectively. The averaged electron temperature and electron density for this plasma jet are found to be ~1.6 eV and ~3.2×10^{12} cm^{-3}, respectively, in this experiment. The densities of OH radical species inside the various bio-solutions are found to be higher by about 4~9 times than those on the surface when the argon bioplasma jet has been bombarded onto the bio-solution surface. The densities of the OH radicalspecies inside the DI water, DMEM, and PBS are measured to be about 4.3×10^{16} cm^{-3}, 2.2×10^{16} cm^{-3}, and 2.1×10^{16} cm^{-3}, respectively, at 2 mm downstream from the surface under optimized Ar gas flow 250 sccm.