

Abstract Submitted
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Multi-electrodes Atmospheric Pressure Plasma Jet Aiming Bio-applications JEON G. HAN, B.B. SAHU, K.S. SHIN, J.S. LEE, NU-SKKU Joint Institute for Plasma Nano Materials, Center for Advanced Plasma Surface Technology, Sungkyunkwan University, Korea, M. HORI, Plasma Nanotechnology Research Center, Nagoya University, Nagoya, Japan — For the recent advancement in the field of plasma medicine, there is growing demand for the atmospheric-pressure plasma (APP) jet sources with desired plasma characteristics. In this study, a stable non-thermal low-voltage APP jet device was designed and developed for optical and electrical characterizations. The jet was operated at very low frequency in the range 10-40 KHz, which enabled the generation of low power ($\sim 7W$) plasma with a plasma column diameter of about 5 mm. The jet has a visible radial diameter of approximately 10 mm. Optical emission spectroscopy was used as a diagnostic tool to investigate the generation of plasmas and radical species. Discharge parameters are also measured to evaluate the different operating conditions. The gas temperature measured at the substrate location varies from 300 to 315K for different gases where the electrical input power ranged from 1 to 7W. The highly reactive species like OH, O, N₂, N₂⁺ and along with the trace of NO are characterized with respect to the different gas flow rate of Ar/He/O₂/N₂, applied voltages, duty cycles and frequencies to evaluate the capability of the APP jet for future bio-applications.

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