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Properties of Dielectric-Barrier-Free Atmospheric Pressure Micro Plasma Driven by Sub-Micro Second DC Pulse Voltage HAE JUNE LEE, CHANG SEUNG HA, HO-JUN LEE, DONG-HYUN KIM, Pusan National University, PLASMA APPLICATION GROUP TEAM — An atmospheric pressure micro-plasma driven by a DC pulse has been developed. This device consists of He flowing two dielectric-free metal electrodes with a voltage pulse shorter than 500 ns, thus it maintains a glow discharge. Spatio-temporal measurements by the optical emission spectroscopy show that the change of partialpressure ratio between He and N_2 is one of the most important factors affecting the discharge properties. The enhancement of the oxygen emissions for higher He flow rate mainly comes during afterglow, which suggests that the dissociative excitation of O_2 by He metastable states is critical process for effective generation of oxygen radicals. As an alternative of atmospheric pressure micro plasma jet based on the dielectric barrier discharge or rf- driven micro plasma, dc pulse driven dielectric barrier-free configuration discharge can be used as an efficient and cost effective source for bio-medical and material processing applications.

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