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Effect of Different Gases on OH Radical Concentration in Ar and He Atmospheric Pressure Microwave Plasma Jet[1] NIMISHA SRIVASTAVA, CHUJI WANG, Department of Physics and Astronomy, Mississippi State University, MS — In non-thermal atmospheric pressure plasmas, OH radical generation can be affected by various parameters such as plasma gases, power, relative humidity, etc. An UV pulsed laser cavity ringdown spectroscopy was employed to measure absolute number density of OH (A-X) (0-0) band at 306-310 nm, generated in an atmospheric pressure plasma jet obtained by a 2.45 GHz microwave plasma source. Addition of N_2, O_2 and H_2O to Ar and He plasma jets, and effect on OH radical generation was studied. Optical emission spectroscopy was simultaneously employed to monitor reactive emission species. Addition of molecular gases such as N_2, O_2 or H_2O results in increase in gas temperature. Addition of O_2 to plasma gas is more favorable for OH generation. Effect of plasma power and gas flow rate was also studied. With increase in H_2O content, OH radical concentration decays faster along the jet axis. Electron dissociation and dissociative recombination are dominant reaction path way of OH formation within the plasma column and in the downstream region, respectively.

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