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Study of OH radical generation in atmospheric pressure microwave plasma jets of Ar, N_2 and O_2 gases using pulsed cavity ringdown spectroscopy[1] CHUJI WANG, NIMISHA SRIVASTAVA, Department of Physics & Astronomy, Mississippi State University, MS, US — We employ UV-pulsed laser cavity ringdown spectroscopy, optical emission spectroscopy and visual imaging, to characterize OH radical generation in atmospheric pressure microwave plasma jets created, respectively, by argon, mixture of Ar and N_2, mixture of Ar and O_2, and mixture of Ar, N_2 and O_2. OH radicals were observed in far downstream for all of these plasma jets (Far downstream is referred to as the location where ratio of the distance from the jet orifice to the length of the jet column is > 3).We also investigated the effect of variations in humidity on OH generation in the APJs. Absolute number densities were measured for OH (v" = 0, J"= 3.5) along the plasma column axis. Effects on OH radical concentrations along the plasma column axis with variations of plasma powers, gas flow rates with different mixing ratios and humidity levels were also studied. The rotational T_{rot}, vibrational T_{vib} and electronic excitation temperature T_{elex} were provided by simulations of emission spectra of the plasmas.

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