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Effect of differing electrode metals on reactive species generation in humid N2/O2 atmospheric pressure dielectric barrier discharge plasmas ALEX GEMSHEIM, SHIVAM PATEL, MATTHEW GOECKNER, LAWRENCE OVERZET, Univ of Texas, Dallas, UTD PLASMA SCIENCE AND APPLICATIONS LABORATORY TEAM — Atmospheric dielectric barrier discharge (DBD) plasma is rapidly expanding as a research field because of its applications in medical, industrial, and processing technologies. To form a DBD plasma, a strong dielectric is used to separate two metal electrodes. This plasma dissociates the surrounding gas, producing reactive oxygen and nitrogen species (RONS). Two RONS of interest include ozone and nitric acid because of the potential to use them in myriad applications. The RONS concentrations in a particular environment can be time dependent. Here we make use of a GEC Reference Cell to create and maintain a well-controlled environment. The Cell is first evacuated, and then refilled to atmospheric pressure with precise mixtures of N2, O2 and H2O. Using Fourier transform infrared spectroscopy we are able to monitor the time evolution of several RONS created in the Cell. By using differing electrode materials, with all other parameters held constant, we are able to examine the effect of differing metal surfaces on RONS generation. For example, gold electrodes enabled the production of 30% more ozone and 3% more nitric acid than copper electrodes at essentially the same operating conditions and time.

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