Abstract Submitted
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Controlling the Effluent Chemistry of a CAP jet for Biomedical Applications: FTIR Diagnostics and Gas Phase Modeling[1] ANSGAR SCHMIDT-BLEKER, JOERN WINTER, SYLVAIN ISENI, MARIO DUENNBIER, ANNEMARIE BARTON, LENA BUNDSCHERER, KRISTIAN WENDE, KAI MASUR, KLAUS-DIETER WELTMANN, STEPHAN REUTER, ZIK plasmatis at the INP Greifswald e.V. — The use of cold atmospheric pressure plasma (CAP) jets with shielding gas devices has proven to be a valuable tool for biomedical applications of plasmas. In order to understand which active components generated by the plasma source trigger desired biological effects, a deeper insight into the species output of CAP jets is necessary. In this work we investigate the effect of different shielding gas compositions using a CAP jet (kinpen) operated with argon. As shielding gas various mixtures of N_2 and O_2 are used with relative humidity ranging from 0 to 100%. For all conditions the densities of O_3, NO_2, HNO_3, N_2O_5 and N_2O in the far-field of the jet are determined using Fourier-Transformed Infrared Spectroscopy (FTIR). A kinetic model for the neutral species humid air chemistry is fitted to the experimental data. The model yields insight into the processes in the CAP jets effluent. It is used to extrapolate the measured data to 2D density maps for each species depending on the $O_2/(O_2+N_2)$ ratio and the relative humidity. The 2D maps serve as a basis for the design of further biological and physical experiments.

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