Abstract Submitted
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Diagnostic of the surface micro-discharge using spectroscopic methods[1] YANG-FANG LI, GREGOR MORFILL, Max Planck Institute for Extraterrestrial Physics, PLASMA HEALTHCARE TEAM — A handheld and battery-driven CAP device is designed for clinical studies. The accomplished medical phase I study has shown high bactericidal efficacy *in vitro*, *ex vivo* as well as *in vivo*. Although tests have been done concerning the biological safety and toxic gas emissions accordingly to the electrical safety, the chemical production of this device is not well addressed. In particular, the ozone production remains to be a big issue for safety reasons and reactive Nitrogen and Oxygen species (RNOS) are regarded to the key players for the biological and medical effects of CAPs. Given the application time for the clinical trial would be in the range of 30 seconds, we will present the temporal evolution of several RNOS within running time of a few minutes. The measurement is done mainly by the optical emission and absorption spectroscopies. Depending on the characteristic parameters of the applied voltage signal for discharge, the production of the RNOS may evolve in different profiles. Especially for high power operation, the discharge takes around 30 seconds to reach a steady state. Although the discharge power is found to be the most important factor, the characteristic frequency and even the gas temperature in ambient air, which in our case is the working gas, may alter the yields of several species, for example ozone and atomic Oxygen. The result will help for developing CAP devices for different applications and to design the protocol for the clinical test concerning the efficacy and safety.

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