Abstract Submitted
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GEC Student Award for Excellence Finalist: Atmospheric pressure generation of high fluxes of singlet oxygen for biological applications J. SANTOS SOUSA, LPGP, CNRS-UPS, 91405 Orsay, France and IPFN, IST, 1049-001 Lisboa, Portugal, G. BAUVILLE, B. LACOUR, V. PUECH, LPGP, CNRS-UPS, 91405 Orsay, France, M. TOUZEAU, LTM, CNRS-UJF-INPG, 38054 Grenoble, France, J.L. RAVANAT, CEA, Inac, SCIB/LAN CEA-UJF, 38054 Grenoble, France — The generation of singlet oxygen states, O2(a1D), by microplasmas has been studied experimentally. For binary He/O2 mixtures, we previously reported that O2(a1D) densities of about 10^{15} cm^{-3} can be efficiently achieved at atmospheric pressure in a 3-electrode microcathode sustained discharge (MCSD) configuration[1]. One solution to increase the O2(a1D) number density is to add, in the He/O_2 mixture, an O-atom scavenger in order to reduce the quenching processes. Thus, we have studied the influence of adding small concentrations of NO molecules. We report experimental results showing that, in $He/O_2/NO$ mixtures and at atmospheric pressure, O2(a1D) number densities higher than $10^{16}cm^{-3}$ were measured in the MCSD afterglow at total flow rates up to 30 ln/min, resulting in O2(a1D) fluxes above 10 mmol/h. This opens opportunities for a large spectrum of new applications. Preliminary experiments were conducted showing that the developed system is particularly useful to study in details the reactivity of singlet oxygen with biological molecules such as DNA constituents. [1] G. Bauville et al., AIAA paper 2007-4025

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