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Influence of molecular additives on the propagation of plasma bullets generated by microjets CLAIRE DOUAT, MICHEL FLEURY, VINCENT PUECH, Univ.Paris-Sud & CNRS — Non thermal atmospheric pressure plasma jets have recently been developed to induce surface modifications and biomedical applications. It was shown that for many device configurations, the jets consisted of plasma bullets propagating at high velocity. While most of the studies were performed with He as a feeding gas, the reactivity of the bullets could be enhanced by introducing into the feeding gas some molecular gases. In this paper, the influence of those additives on the plasma bullets properties will be reported. The microjet investigated here (300 μm in diameter) is produced by a surface DBD composed of a dielectric tube on the faces of which metallic electrodes are glued. The gases are flowing through the inner electrode which is powered by nanosecond pulsed high voltage generator. The feeding rare gases were He, Ne and Ar, while the additives were N2, O2 and synthetic air. The plasma bullet properties were analysed by correlating the electrical parameter, the emission spectra and the images of the bullet position detected with an ICCD with a temporal resolution of 2 ns. It will be shown that the shape, the propagation distance and the velocity of the bullets are sensitive function of the gas flow, of the gas mixture composition, of the applied voltage. For each rare gases, the maximum percentage of additives still allowing the generation of plasma bullets have been determined.

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