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Plasma-water interactions at atmospheric pressure in a dc microplasma JENISH PATEL, University of Ulster, UK, LUCIE NĚMCOVÁ, Brno University of Technology, Czech Republic, SOMAK MITRA, University of Ulster, UK, WILLIAM GRAHAM, Queen's University Belfast, UK, PAUL MAGUIRE, University of Ulster, UK, VLADIMIR ŠVRČEK, The National Institute of Advanced Industrial Science and Technology (AIST), Japan, DAVIDE MARIOTTI, University of Ulster, UK — Plasma-liquid interactions generate a variety of chemical species that are very useful for the treatment of many materials and that makes plasma-induced liquid chemistry (PiLC) very attractive for industrial applications. The understanding of plasma-induced chemistry with water can open up a vast range of plasma-activated chemistry in liquid with enormous potential for the synthesis of chemical compounds, nanomaterials synthesis and functionalization. However, this basic understanding of the chemistry occurring at the plasma-liquid interface is still poor. In the present study, different properties of water are analysed when processed by plasma at atmospheric-pressure with different conditions. In particular, pH, temperature and conductivity of water are measured against current and time of plasma processing. We also observed the formation of molecular oxygen (O_2) and hydrogen peroxide (H_2O_2) for the same plasma conditions. The current of plasma processing was found to affect the water properties and the production of hydrogen peroxide in water. The relation between the number of electrons injected from plasma in water and the number of H_2O_2 molecules was established and based on these results a scenario of reactions channels activated by plasma-water interface is concluded.

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