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Chemistry of neutral species in the effluent of the micro atmospheric pressure plasma jet in water-helium admixture GERT WILLEMS, JAN BENEDIKT, ACHIM VON KEUDELL, Ruhr-University Bochum — A thorough understanding and good control of produced neutral and charged species by cold atmospheric plasmas is essential for potential environmental and/or bio-medical applications. In this study we use the COST reference micro plasma jet (-APPJ), which is a radio-frequency capacitive coupled plasma source with 1 mm electrode distance, which has been operated in helium-water vapour mixture and has been studied as a potential source of hydroxyl radicals and hydrogen peroxide molecules. The water vapour concentration was up to 1.2%. Molecular Beam mass spectrometry is used as diagnostic tool. An absolute calibration of hydrogen peroxide was conducted using a double bubbler concept, because the ionization cross section for hydrogen peroxide is not available. Additionally the effluent chemistry was investigated by use of a 0D and 2D model. Absolute densities of hydrogen peroxide and hydroxyl radicals from atmospheric plasma will be presented. Their dependency on water vapour concentration in the carrier gas as well as distance to target have been investigated. The measured density is between 5E-13 cm-3 (2.4ppm) and 1.5E-14 cm-3 (7.2ppm) for both hydrogen peroxide molecules and hydroxyl radicals. The achieved results are in good agreement with other experiments.

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