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**NO kinetics in pulsed DC low-pressure discharge: influence of $TiO_2$ surface** LINA GATILOVA, OLIVIER GUAITELLA, ANTOINE ROUSSEAU, LPTP-Ecole Polytechnique CNRS, Palaiseau, France, YURY IONIKH, St Petersburgh State University-Russia, STEFAN WELZEL, JURGEN ROEPCKE, INP-Greifswald-Germany — NO, $NO_2$, $N_2O$ are readily formed in air discharge plasma. The study of their formation and destruction in plasma are of interest for environmental protection from industrial emissions. This interest has stimulated extensive experimental and theoretical investigations devoted to studying of air plasmas kinetics. Recently, measurements performed in the afterglow of a pulsed DC discharge showed that NO density scales as a universal function of the averaged power for a very wide set of pulse duration, repetition rate and current; this was analysed using a simple model of the $NO_x$ kinetics [1]: the main source of NO formation is the reaction of $N_2{*}(A^3\Sigma_u^+)$ with atomic oxygen O. In the present work, time-resolved absorption spectroscopy measurements of NO concentration were performed in-situ the positive column of a low-pressure pulsed DC discharge in order to validate this model. It is first shown that NO production during one single plasma pulse is a linear function of the Ixt product where I is the pulse peak current and t the pulse duration.Then, we show that the presence of porous semi-conductor material (TiO2) inside the plasma region leads to a strong decrease of the NO production.
[1] A. Rousseau, L. Gatilova, J. Röpcke, A. V. Meshchanov, Y. Ionikh Appl. Phys. Lett 86, 211501 (2005).

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