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**Influence of electronically excited states of nitrogen and oxygen on plasma kinetics in dielectric barrier discharges.** VITALY DATSYUK, Taras Shevchenko National University of Kyiv, IGOR IZMAILOV, VADYM NAUMOV, Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, VLADIMIR KHOMICH, VYACHESLAV TSIOLKO, Institute of Physics, National Academy of Sciences of Ukraine — Kinetics of non-equilibrium plasma in dielectric barrier discharges (DBD) is of great interest for science and practice [1]. But despite the advances in plasma physics, the mechanisms of plasma-chemical processes are not very clear, in particular, concerning electronically excited states (EES) of oxygen and nitrogen atoms and molecules. We tried to study this issue in detail. Experiments were done in various DBD in oxygen/nitrogen/argon mixtures, employing electrical and optical diagnostics. Measurements showed that DBD plasma processes are accompanied by the formation of EES. Computer modeling by using self-consistent 0D-kinetic and 1D-fluid models, including ionization, excitation, dissociation-recombination, vibrational relaxation, collisional quenching, and radiation revealed the most probable mechanisms of plasma-chemical transformations. Effects of metastable EES, involving singlet oxygen $O_2^*(a,b)$,$O^*(^1D)$ and nitrogen $N_2^*(A)$,$N^*(^2D)$ were examined. Our study confirmed the role of EES in the DBD plasma kinetics and indicated the way to more efficient plasma processing. [1] M.A. Lieberman, A.J. Lichtenberg, *Principles of Plasma Discharges and Materials Processing*, John Wiley & Sons, 2005.

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