

Abstract Submitted  
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**The effect of temperature on electron recombination with water and hydrocarbon ions in high-voltage nanosecond discharge afterglow**  
ANDREY STARIKOVSKIY, Princeton University, MAKSIM POPOV, Moscow Institute of Physics and Technology, IGOR KOCHETOV, TRINITI, NICKOLAY ALEKSANDROV, Moscow Institute of Physics and Technology — The results of the experimental and numerical study of high-voltage nanosecond discharge plasma decay in gaseous H<sub>2</sub>O:N<sub>2</sub> and H<sub>2</sub>O:O<sub>2</sub> mixtures and in ethane, propane and gas mixtures with them were presented for gas temperature from 300 to 630 K, electron temperature ranged from 300 to 25 000 K and pressures from 1 to 7 Torr. Time-resolved electron density during the plasma decay was measured with a microwave interferometer and effective recombination coefficients were obtained. Measured coefficients depend on gas and electron temperatures and on gas density. Numerical calculation of plasma decay was conducted using available data on recombination coefficients and calculated results were compared with measured ones. It was shown that plasma decay in room temperature gases is controlled by dissociative electron recombination with positive cluster ions.

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