

Abstract Submitted
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Nitrogen atoms influence on associative ionization in nitrogen plasma ANDREY VOLYNETS¹, ALEXEY ZOTOVICH², Lomonosov Moscow State University, Faculty of Physics, DMITRY LOPAEV, SERGEY ZIRYANOV, NIKOLAY POPOV, Lomonosov Moscow State University Skobeltsyn Institute of Nuclear Physics — At the increased pressure the associative ionization is the main ionization mechanism in nitrogen plasma realizing due to reactions of metastable molecules $N_2(A^3\Sigma_u^+)$ and energy stored on high vibrational levels of the ground N_2 molecule state. While the role of these species is relatively well understood, the role of nitrogen atoms both in the ground and excited metastable states is not studied yet in detail. This work just deals with this problem and is focused on studying nitrogen atoms kinetics in DC glow discharge at increased pressures (5-50 Torr). Despite of the low dissociation degree the absolute concentration of nitrogen atoms is quite enough for the influence on the ionization mechanism through fast associative ionization reactions between metastable $N(^2P)$ atoms. The production of nitrogen atoms similarly to $N_2(A^3\Sigma_u^+)$ molecules is associated with the excitation degree of nitrogen vibrations. Thus energy stored in N_2 vibrations can be realized into the stepwise ionization through exciting $N_2(A^3\Sigma_u^+)$ and $N(^2P)$.

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