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Electron detachment from O_2^- ions in oxygen under strongly non-equilibrium conditions NICKOLAY ALEKSANDROV, EUGENE ANOKHIN, Moscow Institute of Physics and Technology — Electron detachment from O_2^- ions have been theoretically studied on the assumption that the process proceeds via the formation of vibrationally excited temporary O_2^- ions. The detachment rate was determined on the basis of the statistical approach for the vibrational transfer in collisions between O_2^- and O_2. To validate the statistical approach used, we calculated attachment and detachment rates under equilibrium conditions under which measurements are available. This method was extended to calculate detachment rates in vibrationally excited oxygen. The calculated rates were used to simulate the formation and decay of an electron-beam-generated plasma in N_2:O_2 mixtures at elevated vibrational temperatures. The effect of high electric fields on electron detachment in unexcited oxygen was also studied.

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