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Influence of nitrogen oxides on singlet delta oxygen production in pulsed discharge for electric discharge oxygen-iodine laser ANDREY IONIN, YURII KLIMACHEV, ANDREY KOZLOV, ANDREY KOTKOV, Lebedev Physical Institute of Russian Academy of Sciences, IGOR KOCHETOV, ANATOLY NAPARTOVICH, (TRINITI), OLEG RULEV, LEONID SELEZNEV, DMITRY SINITSYN, NIKOLAY VAGIN, NIKOLAY YURUSHEV, Lebedev Physical Institute of Russian Academy of Sciences, LEBEDEV PHYSICAL INSTITUTE OF RUSSIAN ACADEMY OF SCIENCES TEAM, TRINITI TEAM — Influence of nitrogen oxides NO and NO2 on specific input energy (SIE) and time behavior of singlet delta oxygen (SDO) luminescence excited by pulsed e-beam sustained discharge in oxygen was experimentally and theoretically studied. NO and NO2 addition into oxygen results in a small increase and a decrease of SIE, respectively. Addition of 0.1-0.3 percent of nitrogen oxides was experimentally and theoretically demonstrated to result in notable enhancement of SDO lifetime, which is related to a decrease of atomic oxygen concentration in afterglow. For getting high SDO concentration at gas pressure 30-60 Torr for the time interval less than 0.5 s one needs to add not less than 0.2 percent of nitrogen oxides into oxygen. Temperature dependence of relaxation constant for SDO quenching by unexcited oxygen was estimated by using experimental data on time behavior of SDO luminescence.

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