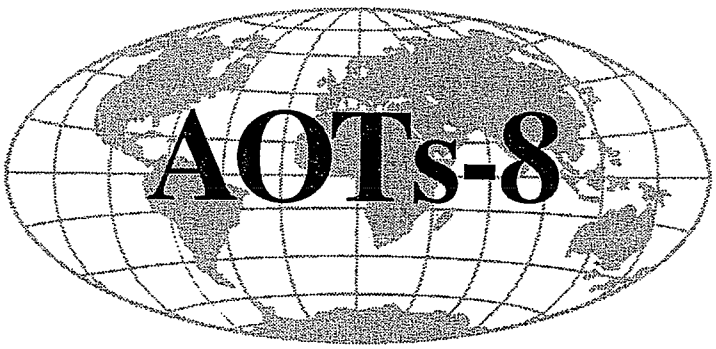

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ABSTRACTS

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OPTIMUM CONDITIONS FOR DE-NOX BY AMMONIA RADICAL INJECTION GENERATED BY AN INTERMITTENT DIELECTRIC BARRIER DISCHARGE

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NO in N_2 gas was removed by injecting ammonia radicals, which were externally generated by flowing the NH_3 gas diluted with Ar gas through dielectric barrier discharge with a one-cycle sinusoidal-wave power source. The discharge was intermittently formed between coaxial cylindrical electrodes with a space of 1.5 mm at an applied peak-to-peak voltage of 2-15 kV. The generated radicals were introduced in a reaction chamber and mixed with NO gas, which was diluted with N_2. The dependence on the discharge power was measured by varying the repetition rate and applied voltage. The energy efficiency increased with decreasing the discharge power. The maximum energy efficiency was obtained at small values of the NH_3 concentration and the discharge power. An ammonia concentration of 1200 ppm with a flow rate of 1.23 l/min and an applied voltage of 3 kV at a repetition rate of 5 kHz were adopted on the optimum values for de-NOx. The rate corresponds to a duty cycle of 5%. As a result, both de-NOx and energy efficiency become maximum. The maximum energy efficiency is 140 g/kWh for NO concentration of 908 ppm. This means that the de-NOx using the ammonia radical injection to the NOx circumstance, application of the intermittent voltage is effective for de-NOx rather than a stationary AC voltage application.