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Efficient non-thermal plasma processing by 5 ns pulsed discharge TAKAO MATSUMOTO, Graduate school of Science and Technology, Kumamoto University, 2-39-1 Kurokami, Kumamoto 860-8555, Japan, TAKAO NAMIHIRA, Bioelectrics Research Center, Kumamoto University, 2-39-1 Kurokami, Kumamoto 860-8555, Japan, HIDENORI AKIYAMA, Graduate school of Science and Technology, Kumamoto University, 2-39-1 Kurokami, Kumamoto 860-8555, Japan — Nonthermal plasma has been widely used for various applications, such as ozone generation, exhaust gas treatment, dioxin decomposition, volatile organic compounds removal and laser excitation. In our laboratory, the pulsed discharge plasmas have been used to treat exhaust gases. Since pulse duration of an applied voltage has a strong influence on an energy efficiency of a pollutant removal, the development of short pulse generator is of paramount importance for the practical applications. Recently, it is demonstrated by our research group that the non-thermal plasma produced using the 5 ns pulsed discharge has extremely higher energy efficiency to produce of ozone and abate nitric oxide. Typically, the yields of ozone generation are 550 g-O₃/kWh in oxygen and 250 g-O₃/kWh in dry air, and the energy efficiency of NO removal from the simulated exhaust gas having 200 ppm of NO in nitrogen is 24 g-NO/kWh. The efficiencies are the highest value in the literatures. In the presentation, the 5 ns pulsed discharge processing would be introduced.

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