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CHARACTERISTICS OF OZONE PRODUCTION BY PULSED POWER

W. J. Samaranayake, Y. Miyahara, S. Katsuki, I. Lisitsyn, R. Hackam, and H. Akiyama
Department of EECS, Kumamoto University
Kurokami 2-39-1, Kumamoto 860-8555 Japan

Experimental investigations of pulsed streamer discharges in air-fed ozonizer under various operating conditions are reported. Ozone concentration (100-9,500 parts per million, ppm), energy input (0.004-0.23J/pulse) and ozone production yield up to 109 g/kWh were measured at various voltages (16-35 kV), pulse repetition rates (25-400 pulses per second, pps), flow rates (1.5-3.0 l/min) and different gap spacings (10-20 mm) using spiral wire made to a cylindrical configuration. A magnetic pulse compressor provided voltage and current pulses with a repetition rate of up to 500 pps. High repetition rates and low gap spacings yielded higher concentrations of ozone at 1.5 l/min flow rate. Nitrogen oxides formed in air-fed ozonizers minimize the ozone production and diminish the discharge current with time. Different compositions of the gas mixture showed that the nitrogen and nitric monoxide (NO) might not be responsible for this current diminution. Nitrogen dioxide (NO2) and ozone (O3) affect the current reduction over a wide range of repetition rates. Additionally the present investigations were extended to assess the performance of pulsed ozone generators using dry air under industrial conditions, where the concentration of ozone and its yield were maintained at high levels.