

PPC '99

CHARACTERISTICS OF OZONE PRODUCTION BY PULSED POWER



12th IEEE International Pulsed Power Conference Abstracts

DoubleTree Hotel
Monterey, California USA

June 27—30, 1999

Wednesday, 1:30—3:00

Maxwell
TECHNOLOGIES

PC067 Maxwell
Technologies, Inc.



Lawrence Livermore
National Laboratory



Pulsed Power Science
and Technology Commit-
tee of the IEEE Nuclear
and Sciences Society



Pulsed Power
Conference, Inc.

DTRA

Defense Threat
Reduction Agency



Air Force Office of
Scientific Research

LANL

Los Alamos
National Laboratory



Naval Research
Laboratory



Sandia National
Laboratory

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.

PH116	Boaz Profman		Thomas Warren	W-80
PC001	W. J. Samaranayake, Y. Miyahara, S. Katsuki, I. Lisitsyn, R. Hackam, and H. Akiyama			W-81
PC002	Leland Bowen			W-82
PC003	Steven Bower		Victor Bochkov	W-83
PC004	Vladimir Bursev	W-81	Victor Bochkov	W-84
PC005				W-85
PC006				W-86
PC007				W-87
PC008				W-88
PC009				W-89
PC010				W-90
PC011				W-91
PC012				W-92
PC013				W-93
PC014				W-94
PC015				W-95
PC016				W-96
PC017				W-97
PC018				W-98
PC019				W-99
PC020				W-100
PC021				W-101
PC022				W-102
PC023				W-103
PC024				W-104
PC025				W-105
PC026				W-106
PC027				W-107
PC028				W-108
PC029				W-109
PC030				W-110
PC031				W-111
PC032				W-112
PC033				W-113
PC034				W-114
PC035				W-115
PC036				W-116
PC037				W-117
PC038				W-118
PC039				W-119
PC040				W-120
PC041				W-121
PC042				W-122