

Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Sterilization of bacteria at low discharge voltage by using microplasma KAZUO SHIMIZU, YUUKI KOMURO, MARIUS BLAJAN, Shizuoka University, Innovation and Joint Research Center — In this paper, Gram-negative *Escherichia coli* JCM20135 and Gram-positive *Bacillus subtilis* JCB20036 were used as the target to be sterilized. The experiments were performed with air and nitrogen as the carrier gas, in order to investigate the influence of different radical species in the microplasma, on the bacteria cultures. Two stainless steels electrodes covered with dielectric barrier materials were faced together. By applying a high frequency AC voltage (about 25 kHz), microplasma was generated between the electrodes. Sterilization by microplasma was confirmed at a relatively low discharge voltage of 1.0 kV when the carrier gas was both air and nitrogen. The sterilization rate by air plasma was better than the results by nitrogen plasma due to the combination effect of ozone, high electric field, UV radiation and other radicals. The sterilization rate of *E. coli* was better than the results for *B. subtilis* due to the characteristics of the cell wall, which is different in thickness and chemical composition.

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Date submitted: 11 Jun 2010

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