

Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Effects of solutions treated with oxygen radicals in neutral pH region on inactivation of microorganism¹ TSUYOSHI KOBAYASHI, Meijo University, HIROSHI HASHIZUME, Nagoya University, TAKAYUKI OHTA, Meijo University, KENJI ISHIKAWA, MASARU HORI, Nagoya University, MASAFUMI ITO, Meijo University — The inactivation of microorganisms using nonequilibrium atmospheric pressure plasmas has been attracted much attention due to the low temperature processing and high speed treatment. In this study, we have inactivated *E. coli* suspended in solutions with neutral pH using an atmospheric-pressure oxygen radical source which can selectively supply electrically neutral oxygen radicals. *E. coli* cells were suspended with deionized distilled water (DDW) (pH=6.8) or phosphate buffered saline (PBS) (pH=7.4) or Citrate-Na buffer (pH=6.5). The treated samples were diluted and spread on nutrient agar (Nutrient Broth). They were cultured at 37° C. The inactivation effects of oxygen radicals on those cells in solutions were evaluated by colony-counting method. O₂ diluted by Ar gas were employed as a working gas for the radical source. The total gas flow rate and the gas mixture ratio of O₂/(Ar+ O₂) were set at 5 slm and 0.6%, respectively. The distance between the radical exit and the suspension surface were set at 10 mm. As a result, the D values for DDW(pH=6.8), PBS(pH=7.4) and Citrate-Na buffer(pH=6.5) were estimated to be 1.4 min, 0.9min and 16.8 min respectively. The inactivation rates in DDW, PBS were significantly different from that in Citrate-Na buffer.

¹This work was partly supported by JSPS KAKENHI Grant Number 26286072 and project for promoting Research Center in Meijo University.

Tsuyoshi Kobayashi
Meijo University

Date submitted: 19 Jun 2015

Electronic form version 1.4