

Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Sterilization of *E. coli* Using 3D Integrated Micro-solution Plasma

JUNPEI YAMAMOTO, KENJI TANAKA, TATSURU SHIRAFUJI, TAKESHI NAKANISHI, MASAYA KITAMURA, Osaka City University — Recently, sterilization of water using plasma has attracted much attention. In most cases, however, the plasma in water is quite smaller than the volume of water. To industrialize the sterilization of water using plasma, we must have appropriate plasma sources for the treatment of large-volume water. Previously, we have developed a novel reactor utilizing three-dimensionally integrated micro-solution plasma (3D IMSP). 3D IMSP generates a large number of microplasmas in contact with the aqueous solution flowing in a porous dielectric material. The 3D IMSP reactor has shown superior performance in methylene blue degradation than a conventional reactor that generates plasma between two stylus electrodes in the water. In this work, we have applied the novel 3D IMSP to the sterilization of *E. coli*, and confirmed that we can sterilize the water of 150 mL with *E. coli* of 10^6 cells/mL within 6 min. We have also observed almost the same results when we treat the *E. coli* with the water treated with the 3D IMSP. We discuss the possibility of the contribution of H_2O_2 and/or the other factors in our sterilization process.

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Date submitted: 15 Jun 2015

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