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Sterilization of *Bacillus atrophaeus* using OH radicals supplied by vacuum ultraviolet method KENTA YONETAMARI, YUSUKE TOKUMITSU, SEIYA YONEMORI, RYO ONO, The University of Tokyo, HACHIRO YASUDA, AKIRA MIZUNO, Toyohashi University of Technology — Sterilization by cold plasma has widely been performed. It is well known that reactive oxygen species (ROS) has a potential of sterilization. However, it is not clear which ROS is effective on sterilization because a lot of types of ROS are produced in plasma. In this study, sterilization effect of OH radicals by vacuum ultraviolet (VUV) method was investigated. This method utilizes photodissociation reaction to produce ROS so it can produce ROS selectively. Wet and dry helium with and without 1% O2 gas was used to demonstrate sterilization effect of OH radicals. Gases were flowed in a quartz tube (inner diameter 2 mm, outer diameter 4 mm) at a flow rate of 1.5 L/min. The produced ROS flowed out of the quartz tube nozzle. A Xe2 excimer lamp emitting 172 ± 7 nm VUV light was placed parallel to the quartz tube with a distance of 8 mm. The distance between the lower end of the lamp and the nozzle of quartz tube was changed from 3 to 15 cm. As a target of sterilization, *Bacillus atrophaeus* (ATCC 9372) was used. The density of OH radicals was measured using laser-induced fluorescence (LIF). As a result, sterilization using VUV method was verified. This result showed that OH radicals sterilized the bacteria.

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