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Sterilization of PET Bottles Using Air Torch Plasma Produced by Microwave Discharge TAKAOMI NAKASHIMA, NOBUYA HAYASHI, Saga University, AKIRA YONESU, University of the Ryukyus, SAGA UNIVERSITY TEAM, UNIVERSITY OF THE RYUKYUS TEAM — Recently, the sterilization of the food container has been attempted using environment-friendly and low-cost oxygen plasma. The sterilization characteristics of PET bottles using by microwave torch air plasma are clarified with changing microwave power and irradiation time of radicals. Radicals as oxidizing agents for sterilization were produced from air discharge. When the microwave of 2.45GHz supplied from a magnetron is absorbed to the stainless wire wrapped around a glass pipe, air plasma is produced in the glass pipe. The radicals with high sterilization ability is emitted from the glass pipe opening edge, and conduct the inactivation of microorganisms which adheres in PET bottle inside. The sterilization of the PET bottles was performed with three different settings of the PET bottle configuration. Generation of active species was confirmed by light emission spectra, and chemical indicators. Sterilization characteristics of non-heat-proof equipments with plasma were clarified using biological indictors. The spore of Geobacillus tearothermophilus was used as biological indicator. The sterilization of Geobacilius stearothermophilus with the population of 10^5 of the whole inside of a PET bottle was successful for the microwave power 200W, treatment time of 5 min.

Takaomi Nakashima
Saga University

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