

Abstract Submitted
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Sterilization of Long Tube Inner Surface Using Oxygen and Water Vapor Plasmas Produced by AC HV Discharge SATOSHI KITAZAKI, NOBUYA HAYASHI, Saga University — Oxygen and water vapor plasmas inside a narrow long tube were produced using an AC HV glow discharge at low pressure in order to sterilize the inner surface of a tube. In order to produce plasma inside a narrow tube, an AC high voltage was adopted. The material of the tube used in this experiment was silicon rubber. The length and diameter of the tubes ranged from 300 to 1,000 mm and from 1 to 4 mm, respectively. The tube was placed in a stainless steel vacuum chamber and was evacuated to 10 Pa using a rotary pump. The material gas for plasma and radical productions was pure oxygen or water vapor, which was introduced to the chamber from a gas cylinder or water reservoir. Light emission spectral lines of oxygen and OH radicals were observed at 777 nm and 306 nm, respectively. The chemical indicator was inserted into the tube and turned to a yellowish color (from the original red) after a treatment, which indicates the generation of sufficient oxygen on OH radicals for sterilization. A tube with the length of 500 mm and diameter of 4 mm is sterilized using oxygen plasma by 10 minutes treatment. Also a tube with the length of 300 mm and diameter of 2 mm is sterilized using water vapor plasma by 5 minutes treatment.

Satoshi Kitazaki
Saga University

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