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**Characteristics of Surface Sterilization using ECR Plasma** AKIRA YONESU, KAZUFUMI HARA, TATSUYA NISHIKAWA, University of the Ryukyus, NOBUYA HAYASHI, Kyushu University — Plasma sterilization techniques have superior characteristics such as a short treatment times, non-toxicity and low thermal damages on the sterilized materials. In plasma sterilization, microorganisms can be sterilized by active radicals, energetic charged particles, and vacuum UV radiation. The influence of each factor depends on the plasma operating parameters. Microwave discharges under the electron cyclotron resonance (ECR) condition produce higher electron temperature and density plasma as compared with other plasma generation techniques. In the present study, characteristics of surface sterilization using ECR plasma have been investigated. The experiment was performed in the vacuum chamber which contains a magnet holder. A pair of rectangular Sm-Co permanent magnets is aligned parallel to each other within the magnet holder. The region of the magnetic field for ECR exists near the magnet holder surface. When the microwave is introduced into the vacuum chamber, a ECR plasma is produced around surface of the magnet holder. High energy electrons and oxygen radicals were observed at ECR zone by electric probe method and optical spectroscopic method. Biological indicators (B.I.) having spore of  $10^6$  was sterilized in 2min for oxygen discharge. The temperature of the B.I. installation position was about  $55^\circ$ . The sterilization was achieved by the effect of oxygen radicals and high energy electrons.

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