LOW TEMPERATURE PLASMA STERILIZATION EFFECT AND MECHANISM ON PSEUDOMONAS AERUGINOSA

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Pseudomonas aeruginosa (PA) is classical opportunistic pathogen in hospitals. World health organization profess this bacteria is the one of primary pathogens of nosocomial infection. In this paper, A self-designed reactor is used for treatments of the PA samples on PET by Ar plasma, which includes of the discharge area and afterglow area and remote area, results show that after treatment of 30s the germicidal effect is 5.71, 4.08, 3.25 respectively in the three areas on the following conditions, discharge power is 15W and gas flux is 20cm^3/min, that is to say, sterilization ratio is over 99.9%. Scanning electron microscopy (SEM) analysis certify the cell cracking before and after plasma treatment. To some extent cell walls or Cell Membrane cracking is testified by determine the content of cell suspensions using UV spectral analysis and the content of protein using coomassie light blue technique, and pH of culture medium increase 0.21 after plasma treatment. On the other hand, electron spin resonance spectroscopy (ESR) results show that oxygen free radical play an important role on sterilization.