Sterilization using pulsed corona microplasma jet

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Résumé

Atmospheric pressure pulsed corona microplasma jet has been used for the sterilization of endospores and E-coli.

Introduction

Microplasma jet for the generation of pulsed corona discharge at atmospheric pressure has been devised for sterilization as well as to modification surface properties. Long filament of plasma is generated inside a quartz tube. Its efficiency of sterilization on inner surface of the tube as well as on objects placed in front of jet was studied. Endospores and E-coli are used for the sterilization studies. Sterilization of endospores, which are placed in front of jet shows very good sterilization results. Sterilization of E-coli coated on inner surface of the tube shows the bacterial survival ratio is 0.0038 %. In addition to this, inhibition studies of bacteria coated on agar plate also carried out (figure 1 and 2). The results obtained in these studies will be presented along with possible sterilization mechanism derived from the plasma parameters.

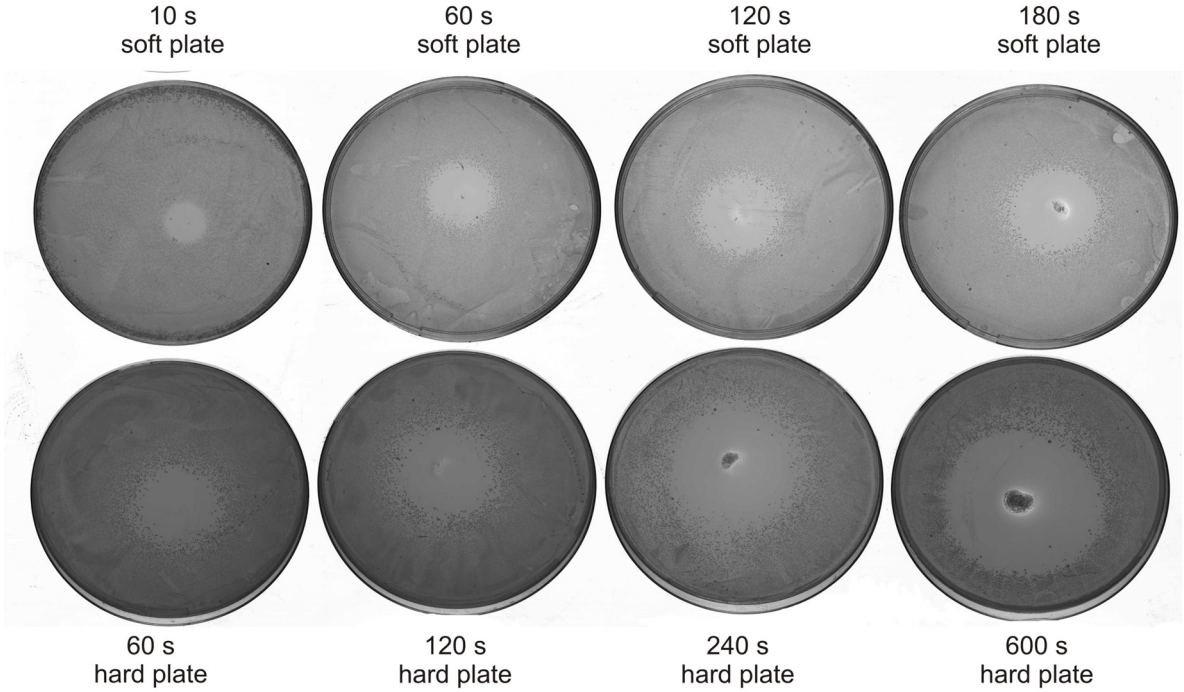

Fig. 1: Images of inhibition zone generated after plasma treatment of E-coli coated agar plates.

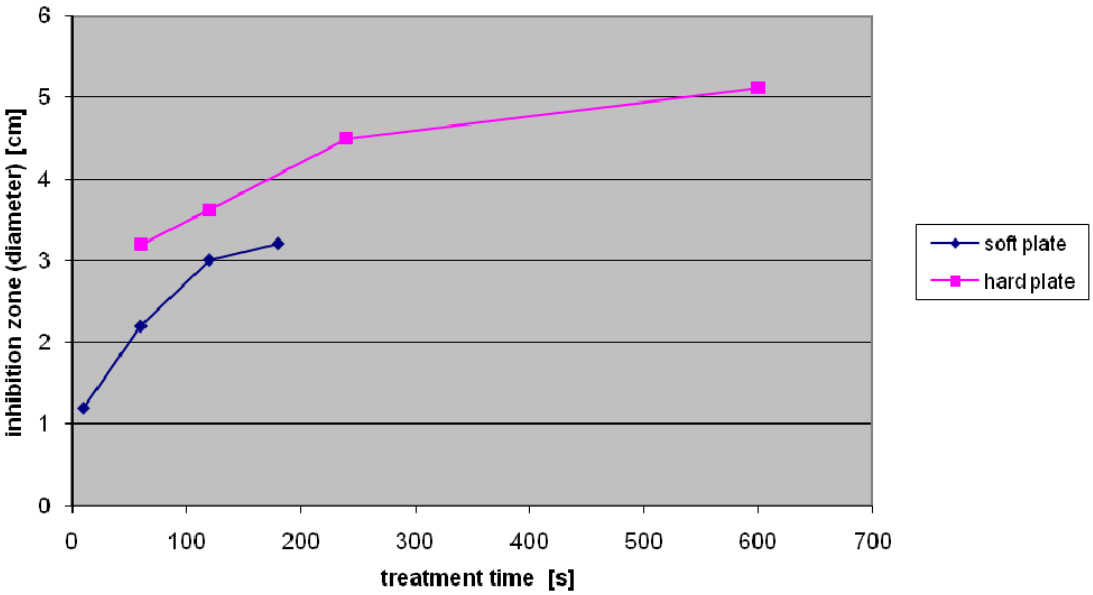

Fig. 2: Plot of inhibition area with respect to plasma treatment time on hard and soft agar plates.

Reference

[1] R. Pothiraja, N. Bibinov, P. Awakowicz, J. Phys. D: Appl. Phys. **43** (2010) 495201.