

Analysis of specifications of a cold plasma generator

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Abstract

© Research India Publications. The generator of 'cold' plasma with adjustable output parameters has been designed and investigated. This design solution allows simplifying and cheapening the plasmotron design and more efficiently sterilizing different thermo-sensitive tools and devices. The discharge analysis was performed within the range of current $I=0\div 30$ mA, voltage $U=0\div 3000$ V, air flow $G = 0\div 2$ l/min and interelectrode gap $l=1\div 5$ mm. The energy and thermo-physical properties of plasmotrons depending on the geometric parameters of device have been obtained. The photo and high-speed video recording of the discharge was performed that allowed establishing two modes of combustion diffusion - multi-channel discharge and constricted-arch. Analysis and processing of data allowed establishing dependences of output parameters on the input parameters of plasma generator that are used by design and investigation of such installations. It was found that both the geometrical size of the chamber, in particular, the interelectrode gap and the current value of the discharge adjusted at the power source by transformer and by additional ballast resistance, if needed, affect the discharge form significantly. This promising trend is related to the necessity of design for medicine and sanitary and epidemiological services of technologies and devices for sterilization and disinfection featuring a number of advantages: relatively high performance, efficiency and reliability of results obtained.

Keywords

Cold plasma, Deactivation of pathogens, Gas discharge, Plasmotron, Sterilization