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Development of Cold Plasma Jet Using Floating Helix Electrode Con guration

Content

Atmospheric pressure glow discharges (APGD) based on dielectric barrier discharge (DBD) offer the prospect of a future basic technology for low-temperature processing of gaseous and solid materials without the use of a vacuum chamber [1]. DBD based atmospheric pressure plasma jets (APPJ's) have wide range of potential applications such as thin film deposition [2], sterilization [3], surface modification [4-5], and etching [6]. Important properties of this type of plasma are that it operates near room temperature, allows treatment of irregular surfaces and has a small penetration depth [7]. A floating helix electrode configuration [8] was implemented for generation of atmospheric pressure DBD based cold plasma jet using Ar/He gas. In this paper, floating helix electrode configuration has been used to generate atmospheric pressure DBD based cold plasma jet using a mixture of argon and nitrogen gas. It was subjected to a range of supply frequencies (10-25 kHz) and supply voltage (6.5-9 kV). The current-voltage characteristics have been analyzed. Furthermore, consumed power has been estimated at different applied combinations (supply frequency & voltage) for optimum power consumption at maximum jet length.

Summary

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