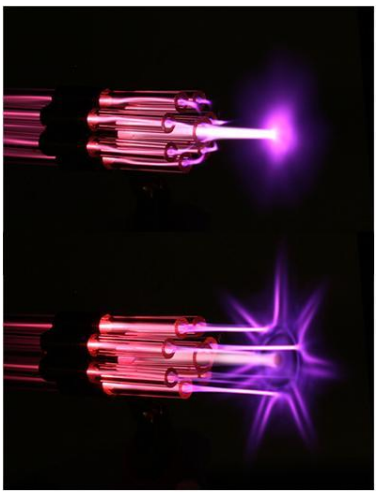
High Density Atmospheric Plasma Jet Devices for Biomedical and Electronic Surface Modifications

Description:

Thin films have a wide variety of use in engineering applications. They are used in microelectronics, aerospace applications, and biomedical applications among others. Current deposition techniques include sputtering, physical vapor deposition, chemical vapor deposition and electrochemical deposition. The main parameters for depositions are the quality and uniformity of the film, growth control and the geometry of the growth. Biomedical thin film coatings have to be free of defects and need a high level of process control for uniformity and adhesion.



This invention utilizes a high density plasma emission by plasma jet-to-jet interaction in the plasma jet array device which has a honeycomb structure with quartz tubes. This plasma concentration behavior by jet-to-jet interaction enables diverse applications to need strong discharge processes involving lots of charged particle transports and chemical reactions of the plasma with a simple structure and equipment. This novel plasma platform allows new material surface possibilities in an achievable manner.

Applications:

- Decontamination/sterilization systems
- Energy storage related material surface applications
- Biomedical device surface modification

Benefits:

- Ability to achieve uniform coating
- Easy and safe cold plasma implementation
- Cost-effective surface modification

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