

## **Microplasma jet for thin film deposition on inner surface of tubes.**

Ramasamy Pothiraja, Nikita Bibinov and Peter Awakowicz

Institute for Electrical Engineering and Plasma Technology, Ruhr-Universität Bochum, 44801 Bochum, Germany

Microplasma jet for the generation of pulsed corona discharge at atmospheric pressure has been devised in order to modify inner surface properties of tubes. Long filament of plasma is generated inside the quartz tube along with precursor, in a way that precursor molecules decompose to produce active particles for polymerization at the close vicinity of tube surface. By this way, uniform film has been deposited for more than 100 mm length of the tube. For the optimization of deposition condition, plasma and precursor-dissociation parameters including reduced electric field, electron density and its energy distribution, rate constant for the different reactions and quantities of precursor molecules dissociated at different places along the axis the tube, are determined using optical emission spectroscopy, micro-photography, current-voltage measurement and numerical simulations. The influence quantity of precursors on the mode of corona discharge and its plasma parameters has also been studied. Precursor dissociation and film deposition process has been modeled with the aid of experimentally obtained information. Simulated results has been correlated with nature of the deposited film, which has been characterized using FTIR-ATR, LSM, SEM, EDX, XPS, XRD, etc.

Reference:

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