

Abstract Submitted
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Study of thin film formation using an rf non-thermal plasma jet at atmospheric pressure¹ FLORIAN SIGENEGER, JAN SCHÄFER, RÜDIGER FOEST, DETLEF LOFFHAGEN, KLAUS-DIETER WELTMANN, INP Greifswald, Felix-Hausdorff-Str. 2, 17489 Greifswald, Germany — The deposition of thin films using an RF-excited plasma jet at atmospheric pressure has been investigated. On flat polymer and glass samples, thin silicon-organic films have been deposited in static experiments using the silicon containing molecules HMDSO and OMCTS. The deposited films have been analysed using profilometry and Fourier transform infrared spectroscopy depending on power and flow rate. High quality films with an O/Si ratio close to two were found for laminar flow regimes. A two-dimensional axisymmetric fluid model describes the interaction of gas heating and flow, the plasma generation in the active volume, the transport of active plasma particles into the effluent and the generation and transport of precursor fragments towards the substrate surface. A remarkable influence of the gas flow on the plasma kinetics is observed only with respect to the density of molecular argon ions, which are transported together with electrons into the effluent. The calculated flux of precursor fragments onto the substrate surface qualitatively agrees with measured profiles of the film thickness.

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