Abstract Submitted
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HMDSO / O_2 atmospheric pressure plasma chemistry leading to SiO_2 film synthesis[1] RUEDIGER REUTER, DIRK ELLERWEG, JAN BENEDIKT, ACHIM VON KEUDELL, Ruhr-Universität Bochum, INSTITUTE FOR EXPERIMENTAL PHYSICS II: REACTIVE PLASMAS TEAM — In the past years, a particular type of atmospheric pressure plasma emerged: non equilibrium microplasmas that operate at low power (< 50 W) and allow the treatment of or deposition on thermolabile substrates. One of the possible applications is a deposition of SiO_2 films. It has already been shown that anorganic carbon free SiO_2 films can be deposited by means of several types of these jets. The main problems are the high film porosity, which is usually controlled by energetic ion bombardment ion low pressure plasmas, and the limited knowledge of the plasma chemistry involved. The latter one is due to difficulties connected with microplasma diagnostics. More understanding and optimisation of deposition process are needed to improve the film properties. Here we report on the deposition of SiO_2 film by means of microplasma jets driven by RF voltage and operated in Ar or He as plasma forming gas. Hexamethyldisiloxane (HMDSO) and O_2 are used as precursor to generate SiO_2. The SiO_2 film composition is measured by FTIR and XPS as functions of varying plasma parameters and distance between jet effluent and film substrate and compared with the gas phase analysed by means of molecular beam mass-spectrometry.

[1]DFG Research Group FOR 1123

Rüdiger Reuter
Ruhr-Universität Bochum

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