Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Spectroscopic studies of MW plasmas containing HMDSO, O_2 and N_2[1] ANDY NAVE, JUERGEN ROEPCKE, INP-Greifswald, Germany, FELIX MITSCHKER, PETER AWAKOWICZ, Ruhr University Bochum, Germany —
The deposition of SiO_x layers based on organosilicon plasmas is used to implement advantageous mechanical, electrical, and/or optical properties on various substrates. The development of such coating processes resulting in a wide range of chemical and physical film properties, using hexamethyldisiloxane (HMDSO) as a precursor, has been in the center of interest of various studies. In plasma, the dissociation of HMDSO into a large amount of fragments is a complex chemical phenomenon. The monitoring of the precursor and of formed species is very valuable to understand the plasma chemistry. Infrared absorption spectroscopy based on lead salt lasers and EC Quantum Cascade Laser have been used to monitor the concentrations of HMDSO, and of the reaction products CH_4, C_2H_2, C_2H_4, C_2H_6, CO, CO_2 and CH_3 as a function of the HMDSO/O_2 mixture ratio, and the power at various pressures in a MW plasma deposition reactor. Optical emission spectroscopy has been applied as complementary diagnostics to evaluate electron density and electron temperature.

[1]Supported by the German Research Foundation within SFB-TR24 and SFB-TR87.

Juergen Roepcke
INP-Greifswald

Date submitted: 17 Jun 2015 Electronic form version 1.4