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Microwave plasma assisted chemical vapor deposition of silica

Holger Gerdes[1], Ralf Bandorf[1], Rolf Schäfer[2], Thomas Schütte[3], Michael Vergöhl[1], Günter Bräuer[1]

[1]Fraunhofer IST, Braunschweig, Germany [2]ROBEKO GmbH & Co.KG, Mehlingen, Germany [3]PLASUS GmbH, Mehring, Germany

holger.gerdes@ist.fraunhofer.de

Silica coatings are part in many optical and electrical applications. Especially, in electrical applications, e. g. as insulator the thin films have to be deposited defect-free. One solution for depositing silica is reactive sputtering, but this process needs usually active process control and leads to low deposition rates compared to CVD. Therefore, CVD-processes are favored in industrial applications. Especially microwave excitation offers a tool for cost efficient production.
In this presentation, we will focus on microwave processes using a parabolic microwave source for deposition of SiO_2-films. The working pressure was varied, as well as the source power and amount of HMDSO/TMS-gas. The plasma is characterized by optical emission spectroscopy. The deposited films are characterized with respect to their electrical (i. e. insulation) and optical properties. Furthermore, the characterization is complemented by SEM investigations of the topography and morphology of the films with top view and fracture cross section.

Keywords
CVD
microwave
silica
insulator