

# Plasma Enhanced Chemical Vapour Deposition of SiO<sub>2</sub>-like Films: Monitoring and Optimization of the Process

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Plasma enhanced chemical vapour deposition (PECVD) has become more and more popular in thin film production industry. Thin layers produced this way have excellent adhesion to the substrate, are resistant to most chemicals and improve mechanical properties of the substrate.

Variety of monomers offers additional advantages. Using organosilicons, e.g. hexamethyldisiloxane, tetramethoxysilane or tetravinylsilane, is a modern trend in PECVD. Thanks to silicon atom in its structure the layer can bind to glass. Organic groups provide many possibilities of modifications of thin film properties, e.g. via grafting. In this manner we can produce SiO<sub>2</sub>-like thin films used in electronic engineering.

This work focuses on high density thin films deposited by PECVD using hexamethyl-disiloxane precursor. Optical emission spectroscopy was used for plasma diagnostics. Oxygen transmission rate and infrared spectra of deposited layers were measured. Optimal experimental conditions for low carbon content layers and layers with good barrier properties were determined. Improvements in this technique will be applied to conservation processes of archaeological artefacts.

Keywords: thin film deposition, optical emission spectroscopy, oxygen transmission rate