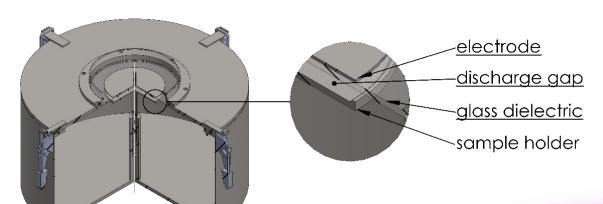
Coatings deposition from liquid HMDSO films via conversion in dielectric barrier discharges

Sebastian Dahle
Clausthal University of Technology

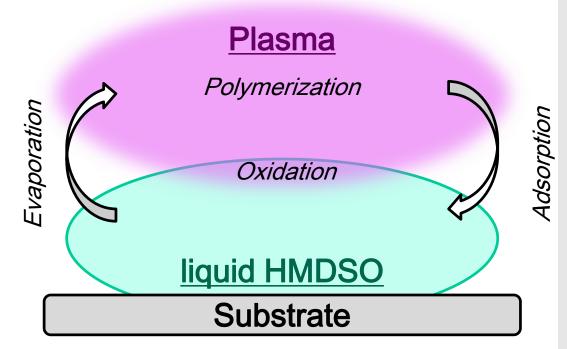
DBD in closed vessel with large buffer volume





Time-dependent parameters:

- Oxygen partial pressure
- Monomer partial pressure
- Evaporation rate
- ...

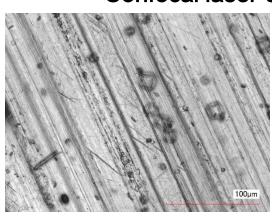


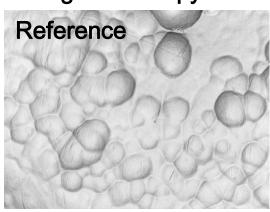
Microscopic results

Optical microscopy

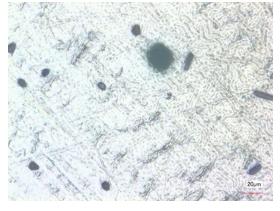
2 mm

Confocal laser-scanning microscopy











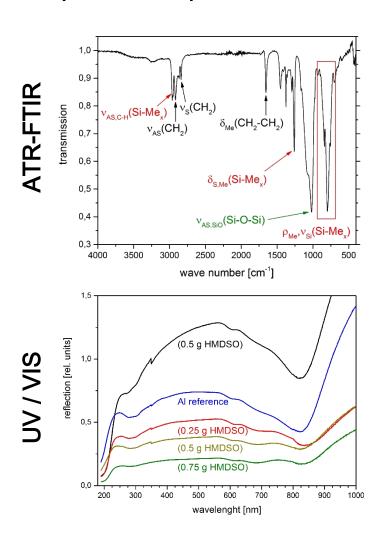
Al sheet

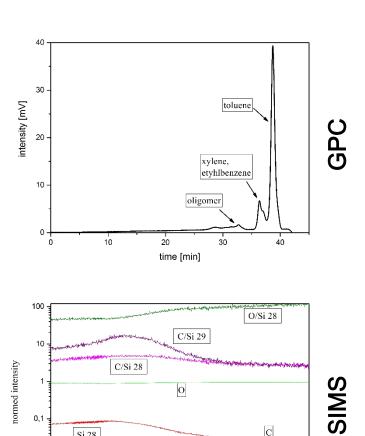
PE foil





Spectroscopic results





Si 28

1200

2400

sputtertime [s]

4800

6000

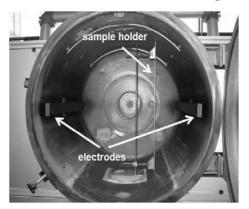
1E-3

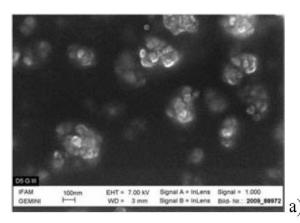


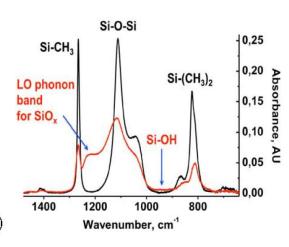


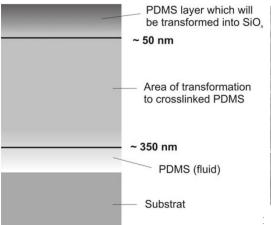
Former use of liquid phases in plasma-based film deposition

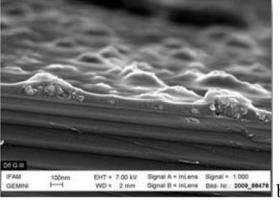
Plasma Curing of PDMS

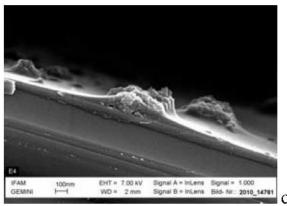










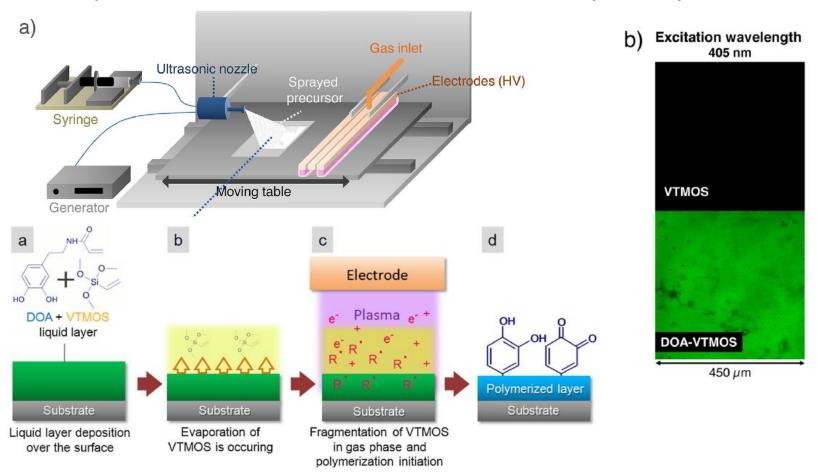






Former use of liquid phases in plasma-based film deposition

Liquid Assisted – Plasma Enhanced Chemical Vapour Deposition



Mauchauffé et al., Plasma Process. Polym. 2016, DOI: 10.1002/ppap.201600002





Plasma-Enhanced Chemical Solution Deposition

Plasma phase

- Dissociation
- Polymerisation
- Cluster / Aerosols
- **>** ...

<u>Plasma</u>

Exchange processes

- Evaporation
- Condensation
- Charging
- Heating

Interphase

- Electrons
- Radicals
- Metastables
- Polymerization
- Etching
- → Chain scission

liquid formulation

Substrate

Liquid phase

- UV photoinitiation
- Thermal initiation
- Cross-linkers
- Particles, pigments, ...