



Der Vorsitzende des Promotionsausschusses

EINLADUNG

Hiermit lade ich ein zum öffentlichen Promotionskolloquium von

Herr M. Sc. Lukas Engel
Kolloid- und Grenzflächenchemie
(Prof. Dr. Tobias Kraus)

am

Dienstag, 21. Januar 2025, 11:00 Uhr s.t.

per Videokonferenz; Link für MS Teams: <https://bitly.cx/TP13d>

Raum für die Prüfung: INM, Geb. D2.5, Leibniz-Saal

Thema der Dissertation:

Morphology, Performance, and Stability of Flexible and Transparent Electrodes Imprinted from Gold Nanowires and -spheres

Flexible transparent electrodes (FTEs) were printed from different inks. Colloidal inks of Au nanospheres or ultrathin Au nanowires were patterned with nanoimprint lithography at different particle concentrations (C_{Au}). Differences in the printed structures were correlated with colloidal ink properties: wire inks agglomerated readily, while sphere inks remained dispersed even at the highest C_{Au} . Plasma sintering converted the imprinted grids into conducting electrodes with thin conductive metal shells around hybrid cores. Shells formed from ultrathin nanowires were coarse and degraded. Spheres formed smooth shells with little or no porosity and aged favorably. Optical and electrical FTE properties were characterized over weeks. The ratio of optical transmittance to electrical resistance for wire-based FTEs initially exceeded that of sphere-based FTEs, but ageing reversed this order.

The underlying instability of wire-based FTEs was overcome by PEDOT:PSS coatings.

Saarbrücken, 7. Januar 2025

Prof. Dr. Uli Kazmaier