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## Structural investigations on PEDOT:PSS polymeric electrodes by means of GISAXS and GIWAXS

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One main advantage of organic electronics is the potential of building flexible electronic devices. The polymer mixture poly(3,4-ethylenedioxythiophene):polystyrene sulfonate (PEDOT:PSS) offers good electrical conductivity, transparency and inherent flexibility, which makes it to a promising alternative to rigid and brittle transparent electrodes like indium tin oxide (ITO). By different treatment methods it is possible to adjust the conductivity and work function of PEDOT:PSS to its desired requirements. Conductivities up to 3000 S/cm were achieved, which makes the electrodes competitive to its metal oxide counterparts. The conductivity of PEDOT:PSS films highly depends on the interplay between PEDOT and PSS and its mixing ratio, which has an influence on the morphology and crystallinity.

In this work the effect of different treatments on the film structure and conductivity is investigated. Different acid treatments were compared to the commonly used ethylene glycol post-treatment and the pristine PEDOT:PSS thin films. In order to examine the influence of the treatments on the film morphology, crystal structure and orientation, grazing incidence small and wide angle X-ray scattering (GISAXS/GIWAXS) measurements were performed. Taking into account the findings of UV-Vis spectroscopy and 4-point measurements a figure of merit is calculated to link the transparent electrode performance to the structure and crystallite orientation in the PEDOT:PSS thin films.

**Primary authors:** BIESSMANN, Lorenz (TU München, Physik-Department, LS Funktionelle Materialien); SAXENA, Nitin (TU München, Physik-Department, LS Funktionelle Materialien); WANG, Kun (TU München, Physik-Department, LS Funktionelle Materialien); YANG, Dan (TU München, Physik-Department, LS Funktionelle Materialien); BILKO, Christoph (TU München, Physik-Department, LS Funktionelle Materialien); BERNSTORFF, Sigrid (Elettra-Sincrotrone Trieste); MÜLLER-BUSCHBAUM, Peter (TU München, Physik-Department, LS Funktionelle Materialien)

**Presenter:** BIESSMANN, Lorenz (TU München, Physik-Department, LS Funktionelle Materialien)

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