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Morphology investigation of the active layer of hybrid solar cells with GISANS

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In the development of non-conventional solar cells not only the achievements of highest power conversion efficiencies and maximum lifetime of devices is of interest. Also the sustainability of the production process of the devices comes into focus. Following this idea, we developed hybrid solar cells with an active layer based on low temperature processed titania and a water-soluble polythiophene [1]. In our approach titania nanoparticles are produced with laser ablation in liquid in order to initiate a functionalization of titania with the polymer for the active layer. The devices and the investigated active layers were produced with spray deposition. With the spray deposition technique the thickness of layers can be easily controlled and the scale-up toward the coating of large areas is done with low effort. In order to understand the structure - function relation we investigated the morphology of the spray-deposited active layers with tof-GISANS at the REFSANS instrument at MLZ, Garching.

[1] V. Körstgens et al., *Nanoscale* 2015, 7, 2900-2904.

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