

Coatings for energy applications – fundamental research and model based scale-up

Philip Scharfer

Thin Film Technology (TFT), Karlsruhe Institute of Technology (KIT), D-76131

Karlsruhe, Germany

InnovationLab, Leading-edge cluster “Forum Organic Electronics”, D-69115

Heidelberg, Germany

Over the last decade, new technologies for energy harvesting, storage and efficient conversion for lighting were getting more and more in the focus of industrial applications. Organic photovoltaic (OPV) and organic light emitting diodes (OLEDs) demand for ultra-thin active layers, with thicknesses in the range of 20-200 nm, coated from liquid solutions. Especially for OPV, the morphology of the dry film has to be precisely defined and strongly depends on the coating and drying process. For energy storage, lithium-ion batteries have reached a more or less mature status in the field of consumer applications. For electro mobility and stationary storage, the cell performance has to be significantly improved, requiring a more fundamental understanding of active material slurry preparation and the subsequent wet film processing steps.

To allow for a fast and effective transfer from fundamental laboratory research to production scale, model based scale-up procedures have to be developed. This talk will give an overview about the current state of the art and ongoing research in the field of thin film coating and drying with focus on energy applications.