Polymer and small molecule nanostructures for applications in organic photovoltaics

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Conducting photoactive polymers offer fascinating new possibilities with respect to energy research applications such as photovoltaics (PV). In the organic photovoltaics (OPV) approach small molecule systems as well as full polymer systems are studied. In a small molecule system typically the p-type conducting polymer is in contact with an electron acceptor as for example PCBM. In full polymer systems both parts of the thin film, the n- and p-type material, are made from such conjugated polymers. For both types of OPV systems, the tailoring of the interface morphology between n- and p-type materials is essential [1]. The small exciton diffusion length in conducting polymers causes a need for domain sizes on that scale. Grazing incidence small and wide angle scattering (GISAXS and GIWAXS) allow for a determination of this inner (bulk film) structure, which is the essential key for tailoring morphologies. In OPV model systems the influence of solvent [2] and blend ration [3] as well as production treatments [4] on both, device performance and morphology, are discussed.