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Exploring the kinetics of Pseudo-bilayer architecture formed during sequential deposition via slot die coating

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Recently, organic solar cells have received increasing attention due to superior flexibility and being light weight. Among the structures of the active layer, planar and bulk heterojunction structures are commonly adopted, which have their individual intrinsic shortcomings. The new developed pseudo-bilayer structure can perfectly combine their strengths and circumvent their drawbacks. Unfortunately, most pseudo-bilayer films are still prepared by spin coating and there are only few researches about pseudo-bilayer films installed by slot die coating, which is a frequently used roll-to-roll manufacturing technique. Besides these researches mainly focus on selecting suitable solvents, changing donors or acceptors, adding third components and tailoring the vertical morphology. The kinetics of forming the pseudo-bilayer architecture with slot-die coating are still unknown. In the present study, PBDB-T-2F (or PM6) and BTP-4F (or Y6) are selected as donor and acceptor, which will be dissolved in CB and CF, respectively. PBDB-T-2F is firstly slot-die coated on the substrate and then BTP-4F is identically coated on the top of PBDB-T-2F. During the deposition, in situ GIWAXS, in situ GISAXS, and in situ UV-vis absorption spectroscopy experiments are carried on to study the formation of the pseudo-bilayer.

Primary authors: ZHANG, Jinsheng (TU München, Physik-Department, LS Funktionelle Materialien); MÜLLER-BUSCHBAUM, Peter (TU München, Physik-Department, LS Funktionelle Materialien)

Presenter: ZHANG, Jinsheng (TU München, Physik-Department, LS Funktionelle Materialien)

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