

In-situ investigation of Aluminum metal sputtering on nanostructured PS-b-P3HT diblock copolymer thin films

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Thin metal coatings on polymers are widely used in electronic devices, such as organic photovoltaic devices and organic field effect transistors. The morphology of the metal electrode on the polymer film plays a crucial role in the performance of such devices. An aluminum contact on polystyrene-b-poly(3-hexylthiophene) (PS-b-P3HT) is prepared with DC sputter deposition. Growth and morphology are monitored using GISAXS and XRR. The nano- and microstructure of the sputtered films is also investigated using OM, AFM and SEM. The crystallinity of P3HT block of the diblock copolymer is examined using GIWAXS. Up-right cylinder structure of P3HT is obtained due to micro-phase separation. The Al layer shows correlated roughness which changes with sputter time, showing a growth on the copolymer film. The observed structures are discussed in the framework of selective decoration of Al on a particular domain.

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