

Organic Photovoltaics

Beamline: U7A

Category of Researcher:
NIST PRT

Technique:
NEXAFS Spectroscopy

Researchers & affiliations:

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Publication: Substrate-dependent interface composition and charge transport in films for organic photovoltaics.

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Motivation:

Next-gen photovoltaics are printable & flexible thin-film, organic, and hybrid solar cells, which rely on the self-assembly of multiple components from solution or dispersion inks. Low efficiencies and poor device lifetimes are related to uncontrolled and poorly understood interface composition and active layer morphology.

Results:

The buried interface composition of polymer-fullerene blends is found by NEXAFS spectroscopy to depend on the surface energy of the substrate upon which they are cast. The interface composition determines the type of charge transport measured with thin film transistors.

Importantly, the results show that the most common fabrication recipe for organic photovoltaics self-assembles “upside down” so that the wrong components are in contact with adjacent layers.

