

Abstract Submitted
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Scanning transmission X-ray microscopy imaging of the grain orientation in a pentacene field-effect transistor¹ BJOERN BRAEUER, AJAY VIRKAR, STEFAN MANNSFELD, DAVID BERNSTEIN, KANG WEI CHOU, ROOPALI KUKREJA, ZHENAN BAO, YVES ACREMANN, Stanford University — The structural quality of organic semiconductors is a key parameter for achieving high field-effect mobility values for organic field-effect transistors (OFETs). We will demonstrate the application of scanning transmission X-ray microscopy (STXM) to image the angular distribution of grains in organic semiconductor thin film devices on the example of pentacene OFETs. The in-plane orientation of the molecules in the channel region and underneath the top conducting electrodes was derived from polarization dependent STXM investigations. It revealed that the orientation of the molecules is conserved for several neighbouring grains. Our studies allow the correlation of the electronic transport and structural properties on the nanometer length scale.

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