

Order Parameters of OLED using GIWAXS

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Abstract:

Organic light emitting diode (OLED) is the newest technology in digital display products due to their advantages in optical, electrical, and organic based properties. Commercialized OLEDs are commonly fabricated through expensive vapor deposition techniques thus generating a lot of interest in more cost-effective process like solution base deposition. This work utilizes the grazing incidence x-ray scattering (GIWAXS) capability at the Advanced Light Source to understand the morphologies of OLED thin films between 50nm to 200nm. To better understand how solution processes influence film morphologies, OLED films are fabricated by solution spin coating and slot-die printing. Using our analysis tool and in-house software (Xi-cam) for data reduction, we have shown so far that the molecular orientation of OLED has weak anisotropy from calculated order parameters in contrast to another amorphous polymer (polyamide-imide) investigated.