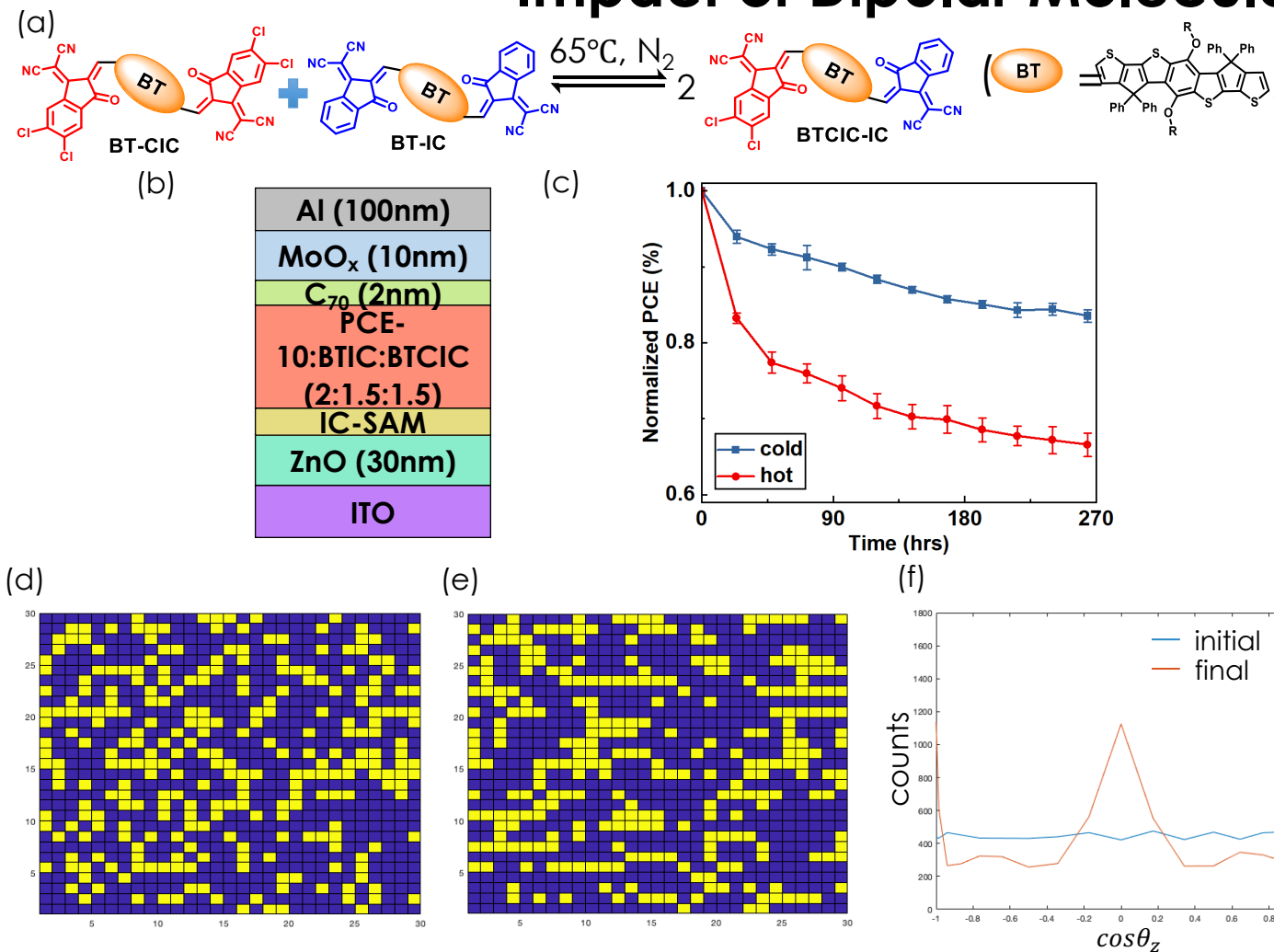


Impact of Dipolar Molecules on OPV Reliability



Objective

➤ To understand the impact of dipolar molecules re-orientation on the electric field in OPV devices and hence the charge extraction efficiency and reliability of devices

Impact

Ternary blend organic photovoltaics (OPVs) comprising one donor and two non-fullerene acceptors (NFAs) have shown substantial increase in power conversion efficiency over the last decades. Our research reveals that chemical reactions would happen during the fabrication of such devices, which will result in the emergence of dipolar molecules in the ternary blends and leads to reduced device stability. Here, we investigate the re-orientation of dipolar molecules during device aging due to dipole-dipole interaction. The orientation of the dipole moments would tend to be anti-parallel with their neighbors and the dipolar molecules would aggregate during device aging. These changes can affect the electric field across the bulk heterojunction, and hence the performance of OPV devices after aging.

Facilities and Methods Used

- Vacuum thermal evaporation
- Spin-coater

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