NIR Absorbing Materials with Low Energy Loss for Semi-Transparent Organic Photovoltaics

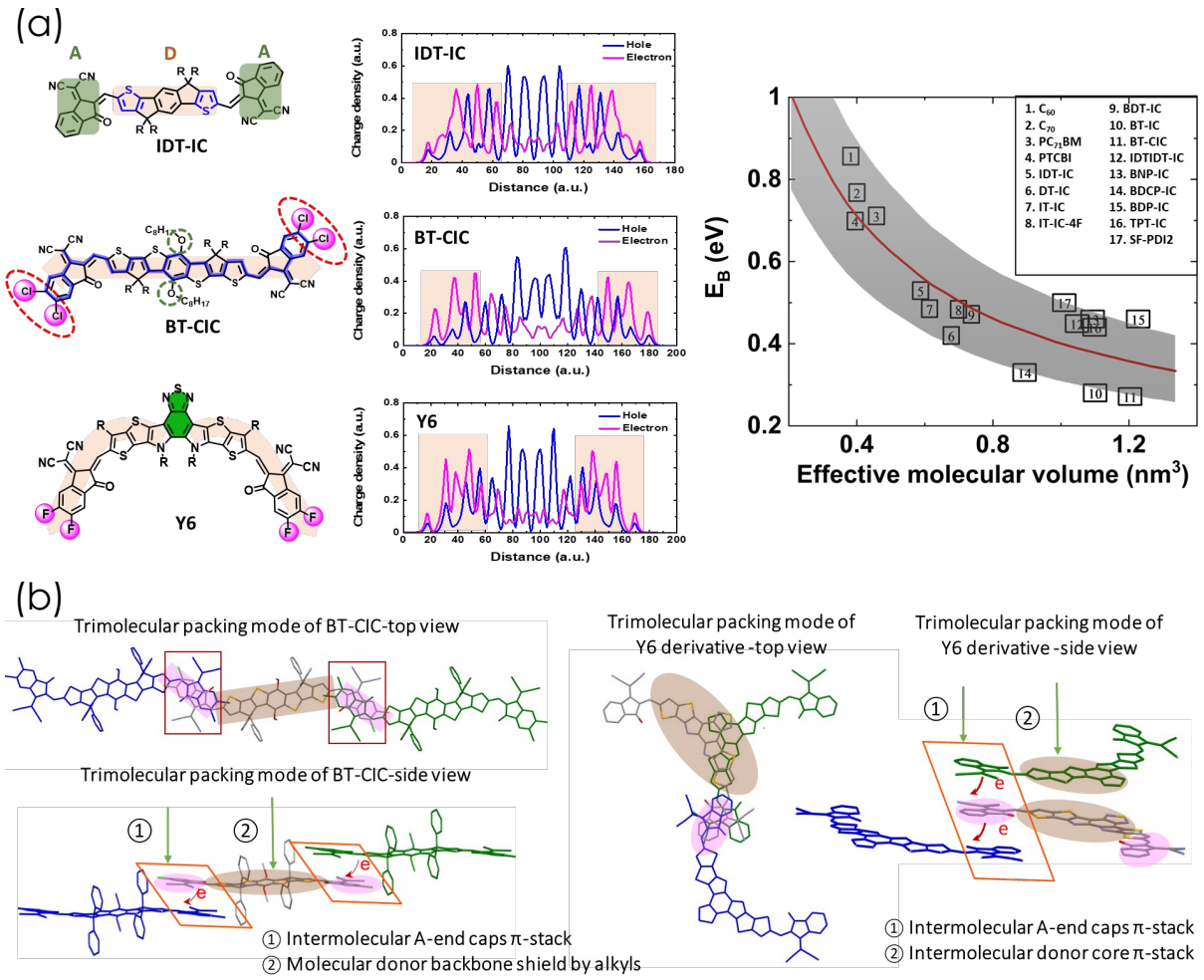

Figure: (a) The molecular structure, calculated electron and hole density distributions along the molecular length of IDT-IC, BT-CIC and Y6, and Exciton binding energy, E_B vs. effective molecular volume for several acceptor molecules; (b) Molecular stacking habits and interactions for BT-CIC and Y6. The purple shading of the end group indicates the spatial positioning of the molecule.

Objective

- To develop materials that preferentially absorb in the NIR, while selectively transmitting in the visible
- To provide a guide to reducing voltage losses of organic photovoltaic from organic photovoltaic materials

Impact

The emergence of highly efficient ST-OPV represents a new paradigm in PV deployment, opening new solar markets that are not well served by the incumbent Si-based PV technology. The selective absorption spectra make organics attractive for application to power generating windows that are semitransparent in the visible, yet absorb strongly in the NIR. Such windows require an appropriate suite of materials to simultaneously provide high efficiency and visible transparency,

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Relevant Papers

- Y. Li, X. Huang, H. K. M. Sheriff, Jr., S. R. Forrest, *Nature Reviews Materials*, DOI: 10.1038/s41578-022-00514-0

Contact

- Yongxi Li (yongxili@umich.edu)
- Xinjing Huang (xjhuang@umich.edu)
- Hafiz Sheriff (hafizkm@umich.edu)

Optoelectronic Components and Materials Group OCM