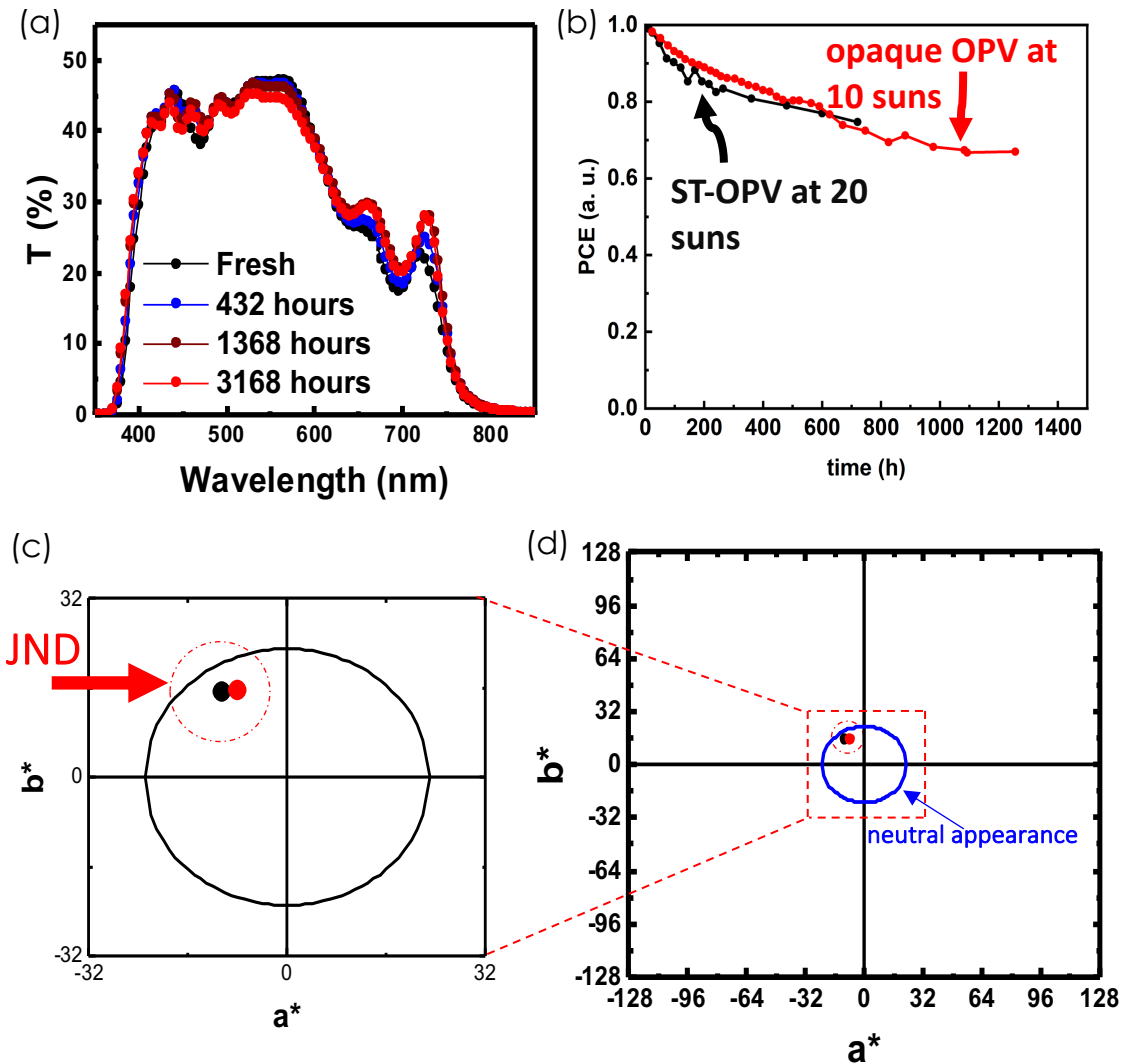


# Reliability of Semitransparent Organic Photovoltaics



**Figure:** Time evolution of (a) transmittance, (b) power conversion efficiency, and (c-d) CIELAB coordinates of the ST-OPV. The just noticeable difference (JND) is indicated in (c) illustrating that the device is colorfast.

## Objective

➤ To study and improve the reliability of semi-transparent organic photovoltaics.

## Impact

Replacing passive glass pane windows with semitransparent OPVs (ST-OPVs) will enable onsite energy generation for buildings and significantly emission. For this to be achieved, ST-OPVs must be reliable. The intrinsic reliability of small molecule as well as non-fullerene acceptor based organic photovoltaics has been demonstrated. This suggests that semitransparent OPV (ST-OPVs) consisting of similar active layers must also be stable. This is project explores the engineering and physics of the reliability of these devices.

## Facilities and Methods Used

- Vacuum thermal evaporator
- Ebeam deposition chamber
- Spin coater
- UV/VIS/NIR spectrophotometer
- Ellipsometer
- 1 Sun, high solar intensities, and thermal reliability test stations

## Relevant Papers

- Q. Burlingame, X. Huang, X. Liu, C. Jeong, C. Coburn, S. R. Forrest, *Nature*, DOI: 10.1038/s41586-019-1544-1
- Y. Li, X. Huang, K. Ding, H. K. M. Sheriff, Jr., L. Ye, H. Liu, C. Li, H. Ade, S. R. Forrest, *Nature comm.*, DOI: 10.1038/s41467-021-25718-w

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