

# Dye Electronic Structure Influences Photocathode Performance

## Scientific Achievement

Enhanced interfacial charge separation yields observed for dye-sensitized NiO films when bipyridyl radical formed is located distal vs. proximal to NiO surface.

## Significance and Impact

Interfacial charge separation dynamics of ruthenium polypyridyl-sensitized NiO are influenced by the electronic structure of the chromophore, providing a simple yet promising molecular design strategy for enhancing efficiency in NiO DSSCs.

## Research Details

- In ultrafast TA experiments (Fig. 2), the charge separated state is observed on the nanosecond timescale for only the CF<sub>3</sub>-substituted chromophore [2].
- Enhanced performance is observed for DSSCs prepared with the CF<sub>3</sub>-substituted chromophore [2], demonstrating enhanced charge separation can be correlated with device efficiency.

Yejee Han, Robert J. Dillon, Cory J. Flynn, Eric S. Rountree, Leila Alibabaei, James F. Cahoon, John M. Papanikolas, Jillian L. Dempsey.  
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Fig. 1

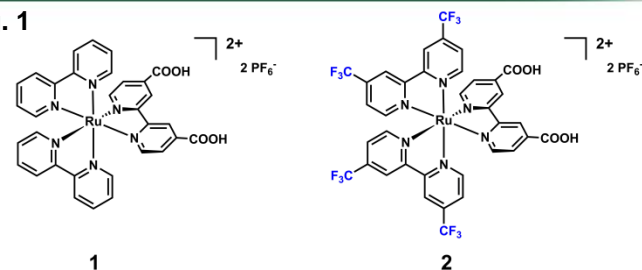
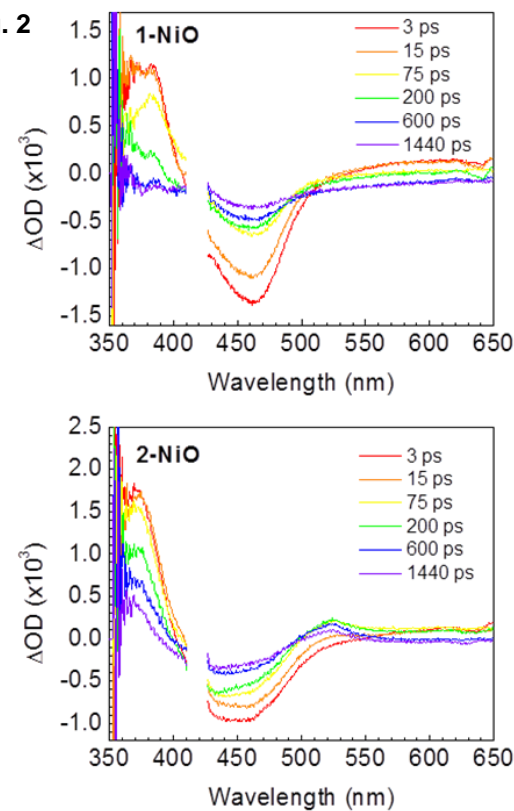


Fig. 2



Work was performed at the University of North Carolina