

Long-lived Charge Separation Using a Light-harvesting Polymer

Scientific Achievement

Photoexcitation of a poly(3-hexylthiophene) (PT) scaffold with pendant Ru(II) polypyridyl complexes exhibits rapid and efficient formation of a long-lived charge-separated state.

Significance and Impact

Long-lived charge separated states are critical for enabling solar energy conversion processes, such as catalytic reactions, to occur.

Research Details

- Excited state formation is partitioned between Ru(II) complexes (40%) and polymer backbone (60%)
- Photoexcitation creates a charge-separated state within 1-3 ps that persists for 20-60 μs
- Attributed to high hole mobility along polymer backbone

Wang L., Puodziukynaite, E., Grumstrup, E., Brown, A., Keinan, S., Schanze, K., Reynolds, J., Papanikolas, J. *J. Phys. Chem. Lett.* **2013**, Submitted

Meyer

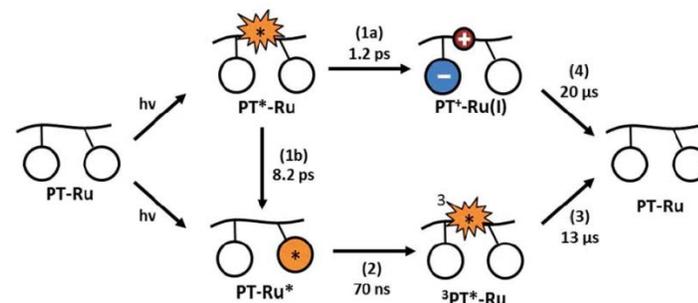
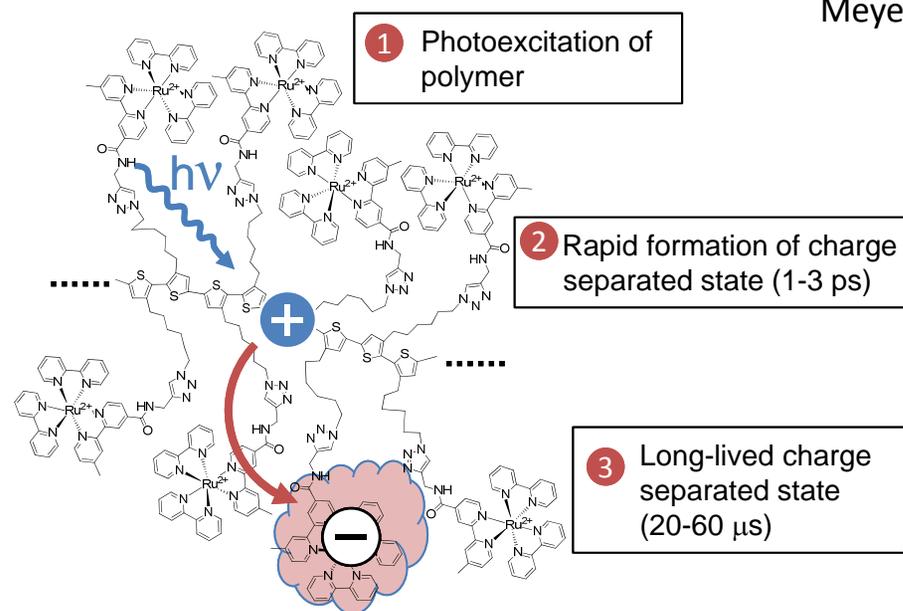


Illustration of the dynamic processes resulting from photoexcitation of the PT-Ru assembly in acetonitrile

Work was performed at the University of North Carolina, University of Florida and Georgia Institute of Technology