

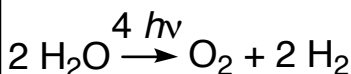
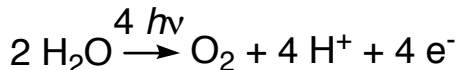
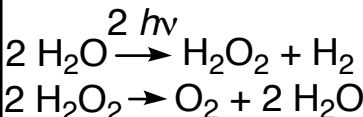
shorter

Usable wavelengths

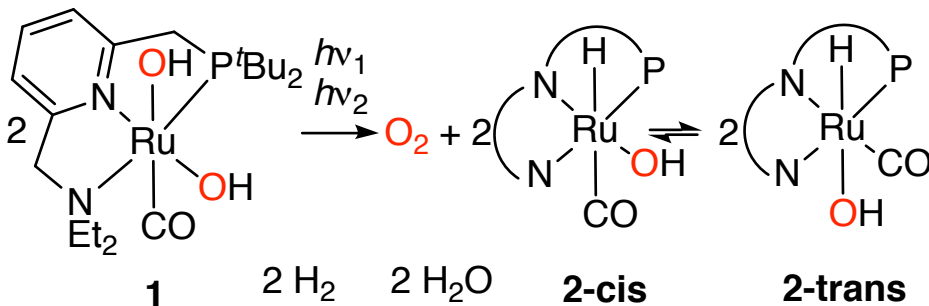
longer



Decreasing kinetic complexity

4  
photons**TiO<sub>2</sub>, SrTiO<sub>3</sub>, ...****Natural photosynthesis**2x2  
photons**C<sub>3</sub>N<sub>4</sub>/CDot**

⊖ Energy loss due to H<sub>2</sub>O<sub>2</sub> formation/disproportionation

2  
photons**Two-photon water splitting**Reaction: Kohl *et al.*, *Science* **324**, 74-77 (2009)Discovery of mechanism: *this work*

- ⊕ Only two photons for O<sub>2</sub> formation
- ⊕ Two different wavelengths (long and short)