

Abstract Submitted  
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**Efficient and Long-lived Charge Separation in a Heteroleptic Ruthenium(II) Polypyridyl Complex** JOSEPH HENRICH, HAoyu ZHANG, JEREMY WHITE, PRABIR DUTTA, BERN KOHLER, The Ohio State University — The excited-state dynamics of a tris-bidentate mononuclear ruthenium(II) complex,  $[(\text{bpy})_2\text{RuL}_{DQ}]^4$  (where bpy = bipyridine,  $\text{L}_{DQ} = 1-[4-(4'\text{-methyl}-2,2'\text{-bipyridyl})]-2-[4-(4'\text{-N,N}'\text{-tetramethylene-}2,2'\text{-bipyridinium})]$ ) was investigated by femtosecond transient absorption spectroscopy in bulk solution and tethered to a zeolite nanocrystal.  $[(\text{bpy})_2\text{RuL}_{DQ}]^4$  is a promising photosensitizer molecule for artificial photosynthesis. Broadband transient absorption experiments in bulk acetonitrile solution reveal that excitation of the MLCT absorption band transfers an electron within one picosecond from the metal center to the bipyridinium (DQ) ligand. Back electron transfer then takes place with a time constant of 1.45 ns. Highly efficient charge separation is attributed to the conjugated nature of the bipyridinium-terminated ligand. When  $[(\text{bpy})_2\text{RuL}_{DQ}]^4$  is tethered to a zeolite Y particle, charge can be transferred to a methyl viologen molecule encapsulated in the zeolite. Zeolites are promising materials for solar energy conversion because of their ability to slow rates of charge recombination. The effects of the zeolite on the photoprocesses of the ruthenium polypyridyl complex will be presented.

Joseph Henrich  
The Ohio State University

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