ULTRAFAST DYNAMICS IN NITRO- AND (ORGANOPHOSPHINE)GOLD(I)-POLYCYCLIC AROMATIC HYDROCARBONS

R. AARON VOGT, CHRISTIAN REICHARDT, CARLOS E. CRESPO-HERNÁNDEZ, THOMAS G. GRAY, *Department of Chemistry and Center for Chemical Dynamics, Case Western Reserve University, Cleveland, Ohio 44106, USA*.

Femtosecond UV/Vis broadband transient absorption was used to investigate the excited-state dynamics in nitronaphthalenes and (organophosphine)gold(I) naphthalenes. Both groups of compounds display similar dynamics. Following excitation with UV light the compounds undergo fast and efficient intersystem crossing to the triplet manifold with a lifetime between 0.1 and 0.3 ps. Once in the triplet manifold, internal conversion occurs from the receiver triplet state to the lowest-energy triplet state (T_1). Vibrational cooling in the T_1 state then proceeds with a lifetime between 3 and 11 ps, which depends on the substituent on the naphthalene moiety. Quantum chemical calculations including solvent effects are used to substantiate the interpretation of the experimental results. Comparisons between the naphthalene derivatives and the previously studied pyrene-containing derivatives[1,2] will be discussed.

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(1) Crespo-Hernández, C., E.; Burdzinski, G.; Arce, R. *J. Phys. Chem. A* **2008**, 112: 6313.
(2) Vogt, R. A.; Peay, M. A.; Gray, T. G.; Crespo-Hernández, C. E. *J. Phys. Chem. Lett.* **2010**, 1: 1205.