SOLVENT EFFECTS ON THE EXCITED STATE DYNAMICS OF 1-CYCLOHEXYLURACIL

PATRICK M. HARE, BERN KOHLER, *Department of Chemistry, Ohio State University, 100 West 18th Avenue, Columbus, OH 43210*.

Photoexcited pyrimidine bases are known to form triplet states in significantly higher yields in acetonitrile than in aqueous solution, but the mechanism behind this solvent effect is poorly understood. Intersystem crossing by the modified nucleic acid base 1-cyclohexyluracil was studied in a variety of solvents, including low polarity solvents like chloroform and n-pentanol. The triplet state of the uracil chromophore was detected by transient absorption using tunable femtosecond pulses in the UV and probe pulses derived from a white-light continuum. In less polar solvents, the excited singlet state decays on a subpicosecond time scale to form the triplet state in a significant yield. The dependence of the triplet quantum yield on solvent polarity, hydrogen bonding ability and pump wavelength is discussed.