

THE SINGLET AND TRIPLET POPULATIONS OF URACIL IN THE COMPOUND 1-(3, 4-DIOXOPENTYL)URACIL

J. G. Burr and Y. J. Lee

Department of Chemistry, University of Oklahoma, Norman, OK 73019 (U.S.A.)

The sensitization of both fluorescence and phosphorescence in 1-(3,4-dioxopentyl)uracil has been measured. Transfer of singlet energy from the uracil moiety to the diketone moiety is about 15-20% efficient. Sensitized phosphorescence of the diketone moiety is also observed; the intensity of the phosphorescence corresponds to a triplet population in the uracil which is about a factor of ten greater than any previously reported. The syntheses and spectral properties of 1-(3,4-dioxopentyl)uracil, 1-(3,4-dioxopentyl)thymine and 1-(2,3-dioxobutyl)uracil are described. These are the first compounds to be prepared which have  $\alpha$ -diketone functions attached to biologically important pyrimidines. The first two compounds exhibit both phosphorescence and fluorescence; the dioxobutyluracil is fluorescent but not phosphorescent. The fluorescence yields of all compounds are about 0.2%, similar to those of biacetyl or 2,3-pentanedione.